
Importance of Talent Development Practices adopted for middle management employees: A comparative study of Chain hotels and Independent hotels in Delhi (NCR)

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Abstract

Talent development practices in the commercial segment of the hotel business tend to be inadequate. Not many hospitality employers fulfill the fundamental requirements established by employment legislation and the HR managers and hotel owners are inadequately advised or even educated about good practices. Poor talent development practices are a matter of great concern since; ultimately, it threatens India's success in tourism and hospitality markets and providing merely low quality job for many individuals. This study aims at examining the interdependency of employee efficiency and work practices adopted in the Independent hotels and Chain hotels in Delhi (NCR). It additionally tries to evaluate the talent development practices and its impact on Independent hotels and Chain hotels in Delhi (NCR). In an attempt to do so, a survey in the form of a questionnaire and interviews was carried out from the sample comprising of 243 hotel staffs from the middle management and the associates categories to find out their views on the topic. The responses received were represented graphically and analyzed using standard analytical tools. The results of this research verify the point that employment practices adopted by the hotels business have a positive impact on the efficiency of its staffs. Nevertheless, the productivity management product must be suitably created to concentrate on employment practices with an aim to improve the employee productivity.

Keywords: *Talent development, Productivity, Hotel*

I. Introduction

The Hotel Industry involves a high level of interaction between customers and employees and therefore offers several possibilities for service problems to occur. The caliber of service encounters is often based on the steps of front line team, whose dedication and experience could be restricted and whose attitudes may differ from one encounter to yet another. The hotel market has improved its competitiveness on account of the latest worldwide financial problems. Fewer individuals are able to go and check new locations, and industry visitors have grown to be fewer as organizations produce severe cutbacks to be able to save cash. Businesses depend on a great recruitment to be able to achieve success, and without each of these, it will be difficult for a company to survive. Hotels today wish to obtain their ideal employees again and by doing so, they're growing their competition. It is acknowledged that companies that focus on their dedicated, regular

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guests and thus encompass high retention are not just gaining regular revenue, though it's likewise cheaper and less cumbersome to invest cash advertising new guests. Businesses within hospitality understand that ideal service every time can't be guaranteed, and consequently to be able to continue customer retention, procedures have to remain available to be capable to manage customer complaints successfully, to stay away from unhappy guests, which might lead to bad word of mouth behaviors along with a bad track record.

This study therefore researches the benefits of service restoration in hotels, dependent on six organizational responses mentioned within the literature. Individuals that have been effective as a front line employee in a hotel, either in independent hotel or a chain hotel, will participate in focus groups, to locate some similarities or variations of opinion.

ii. Literature Review

Murthy (2010) characterized talent administration as "managing the whole employee lifecycle from pulling in and procuring to advancing and finding a successor upon retirement. It likewise incorporates recognizable proof of the key holes between the talent set up and the talent required to drive business achievement." He sees talent administration as the activity of "guaranteeing the ideal individual, in the correct activity at the perfect time". There is no single or brief meaning of talent administration. A blend of all the above definitions uncovers that talent administration is a more extensive issue and can be compared to an attitude. Review of a few other experts situated writing portrays talent administration as a key part to compelling progression arranging while some others guarantee that talent administration is endeavoring to make every one of the employees work at the highest point of their potential.

Chugh and Bhatnagar (2006) characterized as a HR moving toward process that worries with enlisting and holding talents and their development through managing professions, job desires, arranging substitution, recognizing the holes in talents, and on the connection it has to the organization, where this paper will forget enrollment and rather center around talent administration and the setting in talented employees that is now a piece of an organization. As said before the difficulty in talent administration lies in conveying how employees fit in an organizational procedure, this with which variables to search for while recognizing talents with regards to the eventual fate of an organization. Be that as it may, with a specific end goal to misuse the skills and capacities of talents he states the significance of a mutual mentality at all levels of an organization on the best way to oversee talents. As it was there must be an open correspondence at all levels where there is space to express your feeling in the gathering rooms.

Walsh and Taylor (2007) the most grounded drive for employees being focused on their organization lies in the individuals who are most dedicated when confronting testing assignments and work and in this way performs with abnormal state. The reason is on the grounds that they distinguish themselves with the organization and their activity, which makes it more normal to be submitted.

In actualizing arrangements in regards to managing talents Hughes and Rog (2008) hence expresses that the distinctive methodologies of HR rehearse must be founded on the systems either being gone for employees by and large or against a particular gathering. However, for HR hones in managing talents to be actualized in all levels of the organization Morton expresses this is relied upon the responsibility and the drive from the CEO to make this a need, this to change the attitude and the way of life of the organization.

III. Talent Development Practices Adopted In The Hotel Industry

Above discussion only points to one thing, generally for every business, and particularly for a service industry like hotel, employees are definitely the most valuable assets. The employees should be highly motivated, efficient and possess a high morale to participate in the service delivery process that would lead to a better customer satisfaction. Thus more and more attention should be paid to the role of employees in services and investments should be made to improve the most valuable asset of services.

The employment practices followed by the hotel industry can be classified in the following areas:

A) Monetary Benefits

The hotel industry is widely known as among the very poor pay masters. The salary paid to the hotel staffs is much lower when compared with other businesses. There are many reasons for the same. Additionally, because of severe competition in the hotel sector, hotels are fighting for their survival and as a result of the higher overhead along with other fixed expenses that the hotels have, earning profits is a very difficult task. Hence salary or even the labor cost is definitely the sole cost that could be controlled or kept within a limit. Moreover, the forces of supply as well as demand of labor have maintained the salary at a lower level. Nevertheless, on account of the growing competition in the market, staffs have options available because of which the attrition rate has risen in the sector. In order to curb this and then to keep the staffs satisfied as well as driven, the hotels have revised the compensation techniques of their employees by introducing the subsequent monetary advantages in the form of:

- Better salary & wages
- Incentive schemes
- Overtime compensation

B) Training & Development

This is a continuing activity in any organization to improve the abilities of the employees. Just like others, the hotel business has introduced extensive training as well as development programs for their staffs. These programs might stay in the type of on the job training or proper classroom instruction. The sector thinks in continuous development of its service delivery system to complement global standards. Furthermore, with the entry of internationally reputed chain hotels, the hotels have determined the demand of the workers to cope up with the task by obtaining the essential ability sets with these pursuits.

C) Work-Life Balance

The hotel business is characterized with long working hours in several shifts; work that is tough, unpredictable weekly offs, etc. Thus the employees have a bad work-life balance with negligible personal life. The typical working hours of the hotel staffs is 12-14 hours during which they are supposed to be on their toes. Additionally, because of seasonal fluctuations in the business, the hotels work with meager staff to always keep the labor cost less particularly during the off season therefore increasing the workload and working hours of the existing staff. The businesses in hotels are extremely unpredictable in nature and many a times to cope up with the same, staffs need to work on their scheduled weekly offs by sacrificing their commitments with their families. During the festive season too, the hotel staff is supposed to be on their job. With a motive to bring down the severity of this particular issue, hotels have set up the following measures:

- Additional Leaves / Holidays / Weekly offs

- Employee Leisure Clubs / Family Get together.
- Fixed number of working hours per day

D) Work Culture

Work culture may comprise of:

- Employee relations: The professional connection between Employers Employees & within employees. This is a significant part of work culture because the businesses of the company involve the same. Particularly in the hotel business where it's much more of a team work in making the visitor experience memorable, professional rapport within the team members or team bonding is crucial. A proper work culture creates a conducive work environment where the staffs may completely concentrate on the core operational tasks.
- Interactions: These are an important part of any business. Interactions within the structured business might be in the form of horizontal or vertical interactions. As discussed earlier, it is much more of a team effort which is required to offer a quality service to the guest. This effort is meaningless with no proper interactions within the staff members. These interactions might be in the form of group meetings, directions, orders, discussions, briefings, feedback, etc. The success of any organization highly depends upon these interactions.
- Healthy work environment: A stress free work environment is distinguished with equitable & fair organizational policies, cordial employee relations, and effectively defined business structure with clarity of every single individual's role in the business. Such an atmosphere results in higher employee morale that has an immediate impact on the staff's performance and overall productivity of the organization.

E) Employee Welfare

Though each hotel has its own business policy with regard to provision of employee welfare activities, the following practices are adopted by majority of the hotels:

- Meals on duty: This is a unique facility offered by hotels. Staffs are offered meals when on duty. Hotels being in catering business, provision of meals to its staffs are cheap and economical. Though this facility is assumed as a right by the staff members, it proves to be very crucial particularly when working during unusual hours or even working for hours that are long.
- Transport facility: This facility is usually not found in every hotel. Nevertheless, many hotels provide this facility to outstation candidates. One of the reason behind not providing this particular facility is uneven job timings of the staff members. Nevertheless, it's mandatory to provide drop facility to female employees who are working until late night.
- Accommodation facility: This is a typical feature observed in Resorts where majority of the staffs are outstation and finding a rental accommodation is quite expensive. Nevertheless, business hotels offer shared accommodation to the outstation staffs for which they may or may not charge depending on the policy of the hotel.

F) Employee Recognition

Employee recognition is a communication tool which reinforces and rewards the most crucial results men and women produce for your business. When you identify staffs successfully, you reinforce, with the chosen methods of yours of recognition, the activities as well as actions you most wish to see folks do this. A good employee recognition device

is easy, instant, and powerfully reinforcing. A number of employee recognition tools commonly implemented in hotels are:

- Rewarding employees for outstanding performances.
- Appreciation of steady performing employees.
- Employee of the month for exceptional contribution during the month.

IV. Impact of Talent Development Practices on Productivity

It's a well-known fact that the employee practices adopted in organizations have a good effect on the performance of the staff members. It improves their morale and motivates them to give their best to improve their overall performance. Efficiency is a measure of the performance of the staff members towards attainment of the organizational goals. Nevertheless, the impact of each one of these practices on the productivity of the staffs has to be examined. After the impact is identified, organizations are able to focus on such practices to enhance the output of its staff members.

V. Research Methodology

- **Collection of Data:** The information necessary for research was collected utilizing the following techniques:
 - **Personal Interviews:** The researcher conducted private interviews with Human Resource managers and employees and staff of reputed hotel brands to examine the productivity management process adopted in their organizations.
 - **Questionnaire:** A questionnaire bearing straight forward and appropriate questions was drafted and handed over on the sample to get their responses.
- **Sampling Techniques:** The population being employees of hotels is more of less homogeneous in nature because the qualities as well as service conditions of the sector are almost similar in nature throughout the population. With due consideration to this particular aspect, a total sample comprising of 243 hotel staffs from Independent and Chain hotels in Delhi (NCR) was selected for the study. The sample which was selected on random basis represented the 'Manager' & 'Associates' categories of twenty-two hotels in Delhi (NCR).

VI. Findings

Table I: Agreement on whether Talent Development practices followed by the hotel have an impact on the productivity of its employees

	Frequency	Percent
Strongly Disagree	2	.8
Disagree	17	6.8
Can't Say	18	7.4
Agree	142	58.6
Strongly Agree	64	26.3
Total	243	100.0

Talent Development practices adopted by the hotels have an impact on the productivity of its employees

A) Impact of Talent Development practices on Employee Productivity

Areas on which the management should focus their employment practices based of its importance in boosting the employee productivity

Report Mean (7 points rating scale)			
Key Areas for boosting the employee productivity	Category of Hotels		
	Independent Hotels	Chain Hotels	Total
Monetary Benefits (Salary & Wages, Overtime, Incentives)	6.02	5.82	5.91
Training & Development (Skills development, Development programs)	5.45	5.27	5.51
Work-Life Balance (Weekly offs, Holidays, Duty timings)	5.93	5.91	5.87
Work Culture (Employee relations, interactions, healthy work atmosphere)	5.46	5.49	5.51
Employee Welfare (Family Health Schemes, Children Education, Insurance)	4.76	5.28	5.23
Employee Recognition (Rewards & Appreciation)	5.28	5.36	5.46

Based upon the benefits of its in improving employee productivity, the top ranked areas where the management of hotels must concentrate their work practices are provision of Work Life Balance (Weekly offs, Holidays, Duty timings) and Monetary Benefits (Wages and Salary, Overtime, Incentives)

Report Mean (7 points rating scale)			
Key Areas for boosting the employee productivity	Category of Hotels		
	Independent Hotels	Chain Hotels	Total
Monetary Benefits- Better salary & wages	4.56	4.43	4.76
Monetary Benefits - Employee Incentive Scheme	4.80	5.37	5.28
Monetary Benefits - Overtime compensation	4.13	4.62	4.63
Training & Development -Opportunities to attend training programs to enhance operational skills	4.24	4.10	4.39
Training & Development –Personality Development Programs-	6.19	5.94	5.96
Employment -Scientific Recruitment Procedures	5.12	5.43	5.34
Employment -Proper selection of personnel based on the job requirements	5.17	5.29	5.25
Employee Services – Meals on duty	4.98	5.17	5.02
Employee Services-Transport Facilities	4.75	4.52	4.67
Employee Services-Accommodation Facilities	4.75	4.59	4.71
Employee Relations-Employee friendly work culture	5.66	5.31	5.39
Employee Relations -Effective employee grievance handling mechanism	6.04	5.97	5.87
Employee Benefits-Family Medical Benefits	5.45	5.63	5.44
Employee Benefits -Child Education Plans	5.52	5.56	5.45
Employee Benefits -Family Pension Scheme / Insurance schemes	4.74	4.57	4.70
Work-life Benefits -Additional Leaves / Holidays /	6.16	5.92	5.94

Weekly offs			
Work-life Benefits -Employee Leisure Clubs / Get together	5.64	5.33	5.39
Work-life Benefits -Fixed number of working hours per day	6.01	5.94	5.86
Employee Appreciation - Employee Rewards Schemes	5.43	5.64	5.43
Employee Appreciation -Appreciations of performing employees	5.49	5.57	5.45

Provision of Better Wages and salary is essentially the most popular employment methods within the group of Monetary Benefits.

On the basis of its impact on improving employee productivity, the top ranked employment practice relates to the area of Monetary Benefits and Work- Life Benefits

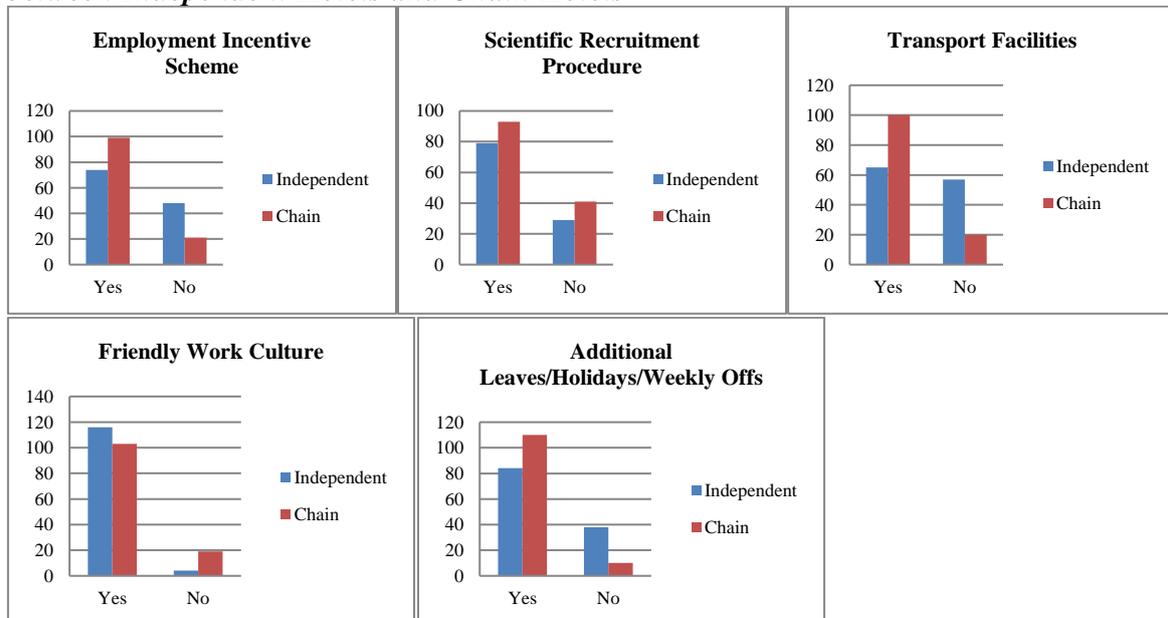
C) Findings on Comparative Study between Independent Hotels and Chain Hotels

Availability of Employment practices in Hotels

Talent Development practices adopted by Hotels	Difference in observations between the category of hotels
1. Monetary Benefits	
Better salary & wages	No significant difference
Overtime compensation	No significant difference
2. Training & Development	
Opportunities to attend training programs to enhance operational skills	No significant difference
Personality Development Programs	No significant difference
3. Employment	
Proper selection of personnel based on the job requirements	No significant difference
4. Employee services	
On the job Meals	No significant difference
Accommodation Facilities	No significant difference
5. Employee relations	
Effective employee grievance handling mechanism	No significant difference
6. Work - Life benefits	
Fixed number of working hours per day	No significant difference
7. Employee appreciation system	
Employee Rewards Schemes	No significant difference
Appreciations of performing employees	No significant difference

Talent Development practices adopted by Hotels	Difference in observations between the category of hotels
1.Monetary Benefits	
Employee Incentive Scheme	Significant difference
2. Employment	
Scientific Recruitment Procedures	Significant difference
3. Employee services	
Transport Facilities	Significant difference
4. Employee relations	
Employee friendly work culture	Significant difference
5. Work - life benefits	
Additional Leaves / Holidays / Weekly offs	Significant difference

D) Talent Development practices adopted by Hotels showing significant difference between Independent Hotels and Chain Hotels



VII. Conclusion

The hospitality business agrees to the point that the work practices followed by the hotels have an impact on the productivity of its workers. Workers belonging to the Manager category experience that hotels must target the work practices pertaining to Work culture, Employee recognition & Development and Training because they've a maximum effect on the efficiency of theirs. Workers belonging to the Associate category experience which hotels must target the work practices pertaining to financial benefits, Work culture & Employee recognition since they've a maximum effect on the efficiency of theirs. Workers belonging to the Manager category experience which the work practices which have a bigger influence on improving the productivity of theirs are satisfactory followed by the hotels where as workers belonging to the Associate category believe the employment practices in hotels aren't sufficiently obtainable in proportion to the impact of its on enhancing their productivity. The most crucial places for improving employee productivity where the management of hotels must concentrate the work practices of theirs are

provision of Monetary Benefits (Wages and Salary, Overtime, Incentives) and Work-Life Balance (Weekly offs, Holidays, Duty timings).

The results on the analysis verify the point that employment practices used through the hotel business have a good effect on the output of its workers. Nevertheless, the productivity management product must be suitably created to concentrate on employment practices that are key with an aim to improve the entire employee productivity.

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Human Resource Development: Impact of E-Learning in Training and Development

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Abstract

The concept of E-learning is very wide. It was invented in the late 90s as the technology improved learning through the internet. Now it's captured a wide range of electric media such as Intranet, Internet, Interactive TV, Satellite broadcast etc. It is dynamic in nature. E-learning is expensive than traditional classroom instruction. Human Resource development is continually looking for cost-effective ways to provide training to employees. Human Resources Development is a human capital economic theory. HRD is also the foundation of training and development Human capital maximization is a Training and development program. The objective of this Research paper is to promote the benefits of training and development through e-learning program and the growth of the individual. Effective Training and development increase productivity and boost morale.

Keywords: *Learning Styles Corporate, Economic Benefits, Training and Development, Information Technology, E-learning, Learning Standard*

Introduction

Human Resource Development

Human Resources Development is the unified of training, career development, the organization put efforts toward improving individual, group as well as organizational effectiveness. Human Resources Development consists of training of individual whether if he or she is first hired, provide various types of opportunities and providing learning like new skills, also provide a task and various activities.

The sequence of process is followed within the HR department somehow it is critical to the employee onboarding and retention. All these things are needed because without proper personal and professional learning and development, without proper training the employee cannot flourish and employee growth is faded. HRD helps or develops the competencies of individuals in an organization for the current as well as for future secured job through the planned learning activities. HRD also take into consideration individual as well as organizational needs.

E-Learning

E-Learning stands for electronic learning; it is a platform that describes how an electronic device and digital media can be helped in education. E-learning blisters down to learning and provide facilities and supported via (ICT) Information and communication technology. (ASTD) The American Society for Training and Development defines e-learning is a platform where a set of applications and processes which includes computer-based learning, web-based learning, digital and virtual classrooms.

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Computer-supported collaborative learning (CSCL) is the new method of learning to boost student towards work together and to solve problems and developed knowledge. It is a classic education in that the lecturer is replaced by the collaboration is the kind of source of information. There are various ways of e-learning such as a smartphone, video apps, Skype, email and social media channels.

Training and Development

Training and development is a crucial part of the human resource development. It is organizational activity concerned with the objective to better the job performance of the individual as well as group. Effective training helps the employee in their upgrading skills and knowledge and also polishing the concept, attitude and developing more knowledge of the performance of employees. There are several names Human capital development and Learning and Development. Training and Development are important in an organization to improve their performance and also fulfillment the self of employees and provide educational methods and programs.

Literature Review

Human Resource Development is a developing system and it's also a continuous process and planned the competencies of the individual as well as a group of employees to achieve the organizational objectives. According to the American Society of Training and Development (ASTD), HRD is the unified use of organizational development, training, and development, career development to improve the individual and organizational objective. The researcher investigated that the Human Resource Development (HRD) is benefits of (KSA'S) of individual's knowledge, skill, and abilities as a support to maximize an individual's dominant.

Importance of T& D

There are various benefits of training and development. Training current an elite opportunity to expand the base knowledge of employees, but a development opportunity finds an expensive. But in their drawback is that training and development provide both the company as a whole as well for individual employees also for their benefit but the cost and time advantageous investment.

Consistency

A designed training and development program certifies that the employees have a consistency knowledge and experience. Consistency is mainly for the policies and procedure of the company which is all should know about what the expectation and procedure which is followed in the company.

Addressing Weakness:

Utmost employees have some weakness in their workplace skills. A training program helps to identify the gaps of, employees and need to be improved or work on those gaps and fulfill the facet of the roles and strengthen those skills. A development program brings all the employees advance level so they have skills and knowledge.

Satisfaction of Employees

The training generates a supportive workplace. Employees with admittance to training and development have the benefit over employees in further companies who are port to pursue out training opportunities on their own. Employees are more satisfied when they feel appreciated and challenged towards their job.

Methods of Training and Developments

There are various Training and Development methods which are used to accomplish the objective are as follows:

E-learning in India

On-the-Job Method

The method of training in which the employees are given training practically in the workplace to develop their skills and competencies.

- **Job Rotation**

Job rotation means to shift an employee on regular or intervals bases from one job to another.

- **Understudy**

Superior is trained his/her employee and its involved his/her to senior and it's called understudy.

- **Experience**

This is the oldest methods of on-the-job training. It is a very time-consuming method but it is very effective also.

Off-the-Job Method

The training methods for which the employees have to leave the organization and take the training from some other place is called off-the-job training. In the Off-the-Job method, the growth of trainees is the primary task and the other is secondary.

Multiple Management

Multiple training techniques was first introduced by McCormick, President of McCormick & Co. of Baltimore in 1932. Establishing a junior board of director this idea given by McCormick. Authority to give to the junior board of members to discuss any problem and also give recommendations to the senior board as well.

Case Study Method

This technique was developed by Harvard Business School, U.S.A. It is used to supplement the lecture method; a case is a written record of the areal business problem. The trainees discuss and analyses the cases as the cases are given to them. The trainees identify the problem by the case study method fulfilling the aim of the case study method. Alternate courses of action and suggestions, solutions are provided by the participants.

Brainstorming

This technique is called creativity training; it helps to solve problems in the new and different way. In this technique, the trainees are given the opportunity to generate ideas without being judgmental. Criticism is not allowed so as to reduce inhibiting forces. Once a lot of ideas are generating then they are evaluated on different parameters.

E-learning Market – By learning Model

According to the eLearning Market- Global outlook and forecast 2018-2023 the e-learning market by learning mode is classified into self-paced and instructor-led learning. Self-paced learning mode has the largest segment in the e-learning market occupied in 2017 market share was over 77% and its expected that covered \$43.54 billion during the forecast period.

Approximately 50% of the total self-paced learning share in 2017 was captured by North America. It's growing as well as continuous learning technology it can be used at any time at anywhere is driving the growth of the globale-learningmarket platform. The self-

paced learning module is growing demand in the market as well corporate sector it will bring new opportunities and challenges in the market during the forecast period.

Research Objectives

- To understand the impact on e-learning in different industry
- To understand the impact on e-learning in Pharmaceutical Industry
- To understand the impact on e-learning in Automobile Industry

Research Methodology

This is literature review research in which research is in form of reviews, analyses and synthesizes the representative literature on a topic in a unified way such that new context and perspective on the topic are generated. It has fully coordinated the topic which is E-learning in training and development in the review of the literature. A collection of data's, finding and conclusion are attached to an integrated review of the literature to make this research.

The literature view is prepared with the help of an online journal, articles, database, Elsevier, EBSCO (Management research data). Google scholar, eLearning Market- Global outlook and forecast 2018-2023 etc. which are highly concentrated on the impact of E-learning in training and development review. The keywords used for research are Learning Styles Corporate, economic benefits, Training and Development, Information Technology, E-learning, Learning Standard. A total of 102 articles are searched for this research, out of which 35 articles are reviewed based on that the different technologies trend that is impacting e-learning in training and development and the benefits of e-learning in training and development on HRD with respect to technological term are studied and well explained in this research.

Findings

Impact of E-learning in Different Industry

E-learning has been adopted obedience training program. According to comm lab (Global learning solution), survey 98% organization towards the maturity admitted that fondness for technology- enable compliance training. Its comfort with training can be tracked as well as record maintained and also fulfill the compulsory requirement by regulatory.

Benefits of eLearning in the Pharmaceutical Industry

In pharma industry e-learning in training and development program has significantly grown in the recent year for training employees. E-learning is just not for the enhanced the convince training, but also determine the challenges of narrow consideration interval of humans with training modules that are easy to be used. There are numerous technologies to the train the employees and also eLearning has the latest and reliable trend. Pharma companies followed by a certain law to ensure that the safety and efficiency of their products in the market. Although the Standard Operating Procedures (SOP) which is professional's industry demand to get trained as per standard aspect. Safety and environment training by Current Good Manufacturing Practices. (cGMP). Training is the continuous process in the industry, to maintain a record of all training which has been conducted and also a detailed audit of the company.

Key Benefits of eLearning in the Pharma industry

Mobile Sales Team Training

Sales teams are mainly involved in fieldwork and it's really tough for them to obtain knowledge and also admittance a training course at the time of need. Though, eLearning took an easy platform for training to sales professional in a better manner. At any time, it's

accessible they got useful information and updates. ELearning is cost-effectiveness in a pharma company; it's a continuous learning for sales teams.

Customer Training

Pharma Company has allowed free learning courses to customers through eLearning in this the person who wants to know about the products and process of the company.

Updating and maintaining Training Materials

ELearning has always certified that Pharma Professional can update with the latest trend and information about the company at any location at any time.

Automating Retraining and Certification Programs

To learn or want a certificate program the eLearning is always helped for the learner and also to take the course multiple times and they left midway. Through the Learning Management System (LMS) can be done certificate programs and courses and also brings competition with the team through this its increase productivity of the employees.

Training challenges of the manufacturing industry- eLearning can help

Manufacturing sector's play a vital role to contribute to any country's economy. New technology trends were emerged and innovative manufacturing practices. Employees are trained in new technology which is automated manufacturing services. It is not possible to conduct classroom training they don't have time however online training is to be provided for learning.

Spreading of Skills Gap

In workplace training program through the help of the eLearning program may conduct by easier, dynamic and more affordable resources. There a various visual element of e-learning courses such as video, animation, and infographics to design an effective strategy to provide knowledge. And also improving the learner engagement and knowledge retention.

Training of High Cost

To minimize the training cost, employee training as learning courses is providing. Companies have spent a lot of individual man-hours for Instructor-led training. Cost effective alternative online training is providing for ILT/ classroom training due to reducing trainer cost, lodging, and boarding. In this way, merged learning works thriving manufacturing training.

Wide product portfolio

Employees in the manufacturing industry are under a continuous burden to new products innovation for better through the year. Without training they mislaid in their regular. The employee may not innovate but make better products portfolio. However, eLearning helps in step by step of development of product i.e., research, idea, final design it's increased the stages load on the employee. In addition, refresh the training to the employee and analyze what they had learned earlier.

Impact of E-Learning on Automobile Industry

In Automobile Industry practical knowledge requires about vehicles, operation engineer, and service. Training is crucial and it requires on the ever-changing industry. It is very costly if conduct a classroom training session in their thousands of worker is there. E-learning is the best solution for learners. E-learning is the platform for the integration of games, an enterprise with the training to improve the learners' participation and performance. In today's scenario, the automotive industry is working hard for helping

workforce and conducting soft skill training such a problem solving, communication etc. through this to help a person with updated today's technology.

Scalability

E-learning now a day's spreads widely. Because of the huge scale of economics. The administration is expected to conduct a training program, including the person who did a work remotely and those at the office location. So, e-learning has become a wide and feasible approach for providing training across different location and also for business growth.

Boosted technology

Technologies continuously change and the substructure requires for effective training provided in widespread. But most of the complication that came across but e-learning have collapsed with the industry standards.

Consistency

Digital training is now the latest trend rather than instructor-led training e-learning has various coursewares which is designed per customized training needs. Editing or correction can be done without any printed materials.

Conclusion

As important as learning and development are, for today's workforce it's even more important to consider how they are accessing these opportunities. The key points of discussion are drawn from the study stated in this paper are:

- Real benefits of e-learning suggest a variety of training in many areas, it harvest superior outcomes to classroom-based learning for the learner.
- E-learning also comprises cost and productivity benefits of Human resource development.
- E-learning as an increasing part of delivering on the training strategy.

Limitations of the Study

The present study is a literature based study that has focused mainly on the training and development of organizations with respect to e – learning platforms. The study has focused on the different sectors such as – manufacturing, automobiles, pharma only. The conceptual references of the variables have been discussed. The study lacks the factual data from the same industries.

Future Scope of the Study

It is expected that the domain of e – learning platforms will grow in near future as there is higher demand for the technology driven platforms in the different sectors. Various tools and software supporting the task of trend design and also the support of the analysis, design, implementation, and development through Web. There is an urgent need to test the concepts in different sectors empirically. Apart from the three sectors discussed, technology is gaining its value in other sectors too; hence, the future of the study in different sectors is worth testing empirically. The study can be further tested on the longitudinal research frames.

Managerial Implications

The Research of this study important implication to HRD e-learning practices. It may deliver an effective e-learning motivation is a grave factor and determine an employee's determination in learning participation. In E-learning interference through auspicious policy requirement, it helps the organization and also motivates employee participation. It also avoids a work-life conflict, its motivating to the employee engaging through e-

learning at home during off work hours. E-learning has the potential to transform when and how the employees will learn. Learning will become combine with work and also will use more modular and more use shorter. The organization always to support employee's e-learning participation because on-the-job learning time is reducing interruption of the process of learning. In short, the implementing HRD e-learning training and development program its close attention to individual motivation as well as learning support ensure that encourage the employee participation as well as successful and support to completion of e-learning.

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Women Fish Trade Entrepreneurs in Kanyakumari District–A Study

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Abstract

Entrepreneurship is a major channel for economic growth, productivity, and development in India. History has shown that entrepreneurs establish new businesses that create employment and provide services and products to increase the wealth of their local and national economies. Examining the women entrepreneurial challenges tends to provide some useful insights into some theoretical issues. It is the need of the day to empower the women-socially, economically, politically, and legally in various facets of their life in order to sustain their livelihoods more effectively. In short, the study will be highly useful to researchers, planners and policy makers in overcoming the problems of fisherwomen traders and in formulating strategies for empowerment of fisherwomen. The study mainly based on primary data. The sample size was fixed at 250. The major finding is Lack of basic facilities in market places.

Key words: Women entrepreneurs, Fisher women, Fish trade

Introduction

The women fish traders, despite her vital role in the fishing industry, not only faces different types of problems at each stage in her profession, but also has to hold on to the means of livelihood under constant threat of competition from complicated sales outlets such as refrigerated booths. Invariably, she undertakes the job of fish marketing in addition to the household responsibilities of cooking, raising children, and attending to the needs of family. At the same time she also has to care for any unsold fish that she has had to carry back home, finding the time and energy to clean and salt the fish, and to dry it the next day. To add to her problems, her financial responsibilities at home are many. In order to carry out these responsibilities she has to be consistently efficient and successful at procurement of fish and its marketing. These facts add up to make the life of the female fish vendor extremely stressful and with concomitant health problems such as back pain, headache and poor eye sight.

Objectives

1. To analyze the relationship between socio economic factors and women entrepreneurs in fish trade.
2. To identify the problem of women entrepreneurs in fish trade and suggestions to overcome those problems.

Methodology

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“Ex-post facto design” was employed in the present research study as the events have already occurred and design was considered appropriate. The data mainly based on primary data. The data was collected from the respondents through personal interview. The sample of the study shall comprise 250 fish trade women entrepreneurs from various parts of Kanyakumari district selected using stratified random sampling. In consultation with experts in the field of statistics and extension education the following statistical tools were used for analysis. They are percentage analysis, Mean & standard deviation, Correlation co-efficient and multiple regressions.

Analysis

Relationship between Socio-Economic Factors and Women Entrepreneurs in Fish Trade

The relationship of independent variables with dependent variable like economic motivation and risk orientation is discussed. Pearson’s simple correlation and multiple regression were used for analyze the relationship is presented in the table 1 & 2.

Table.1 Relationship between socio economic factors and women entrepreneurs in fish trade

Variables	Factors	Correlation co-efficient	
		Economic motivation	Risk orientation
X ₁	Age	0.055NS	0.165*
X ₂	Education	-0.222**	-0.169*
X ₃	Marital	-0.059NS	-0.010NS
X ₄	Family status	0.324**	0.228*
X ₅	Experience in fish trade	-0.171*	-0.162*
X ₆	Annual income	0.244**	0.022NS
X ₇	Annual expenditure	0.212**	0.031NS
X ₈	Achievement motivation	0.183*	0.172*
X ₉	Social participation	0.228**	0.102NS
X ₁₀	Contact with customers	0.162*	0.045NS
X ₁₁	Credit orientation	-0.014NS	0.216**
X ₁₂	Market orientation	0.332**	0.302**
X ₁₃	Self confidence	0.125NS	0.292**

Source: Computed data

Note: *Correlation is significant at the 0.05 level (2-tailed); **

Correlation is significant at the 0.01 level (2-tailed); NS- Non significant

The table shows that nine of the independent variables had a significant relationship with the dependent variable economic motivation and eight of them had a significant relationship with the other dependent variable risk orientation. Among the nine independent variables that showed significant relationship with economic motivation, six of them namely education (X₂), family status (X₄), annual income (X₆), annual expenditure (X₇), social participation (X₉) and market orientation (X₁₂) showed significance at 1% level and the remaining three, experience in fish trade (X₅), achievement motivation (X₈) and contact with customers (X₁₀) showed significance at 5% level. Out of the eight independent variables showing significant relationship with risk orientation, five of them namely family status (X₄), achievement motivation (X₈), credit orientation (X₁₁), market orientation (X₁₂)

and self confidence (X_{13}), showed significance at 1% level and the other three including age (x_1), education (X_2) and experience in fish trade (X_5) showed significance at 5% level.

Table.2 Relationship between socio-economic factors and women entrepreneurs in fish trade

Variable	Factors	Regression	
		Economic motivation	Risk orientation
X_1	Age	-0.013	0.807
X_2	Educational status	-0.227	-0.161
X_3	Marital status	0.02	-0.002
X_4	Family status	0.511	0.286
X_5	Experience in fish trade	-0.824	-0.826
X_6	Annual income	0.726	0.008
X_7	Annual expenditure	0.078	0.355
X_8	Achievement motivation	0.132	0.212
X_9	Social participation status	0.171	0.094
X_{10}	Contact with extension	1.514	0.364
X_{11}	Credit orientation	0.739	0.581
X_{12}	Market orientation	0.663	0.716
X_{13}	Self confidence	0.234	0.621
$R_1=0.552$	$R_2=0.504$		
$F_1=4.658$	$F_2=3.621$		
$R_1^2=0.304$	$R_2^2=0.255$		

Source: Computed data

The table shows that the R and R^2 values. The R_1 and R_2 value represents the simple correlation is 0.552 and 0.504 respectively with dependent variables economic motivation and risk orientation. The R^2 values indicates how much of the total variation in the dependent variables, economic motivation and risk orientation, can be explained by the independent variables. In this case, R^2 implied that the independent variables can predict the dependent variables economic motivation and risk orientation with 30.4% and 25.5% accuracy respectively. The table further indicated that the regression model predicts the dependent variable significantly well. Here, $p < 0.0005$, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.

Problem of Women Entrepreneurs in Fish Trade

Fisherwomen entrepreneurs were asked to point out the difficulties that they face while in fisheries activities. The main problems faced by them are presented in table.

Table.3 Problems faced by fisherwomen

Sl.No	Problems	Number	Percentage	Rank
1	Lack of marketing facilities	217	86.8	VI
2	Health problems associated with work	155	62.0	X
3	Lack of transportation facilities	227	90.8	IV
4	Unhealthy market places	162	64.8	IX
5	Competition from male counter parts	230	92.0	III
6	Problems from consumer	180	72.0	VIII
7	Lack of basic facilities in market places	242	96.8	I
8	Lack of infrastructure facilities	209	83.6	VII
9	Price fluctuations	222	88.8	V
10	Lack of storage facilities	238	95.2	II

Source: Primary data

The table.3 shows that a major problem for majority of the respondents was lack of basic facilities in market places. Providing a women friendly situation in the market places by ensuring all basic facilities is important. This was followed by 95.2 % respondents complaining about lack of good storage facilities in the market. As fish is one of the most perishable products, arrangements must be made for supplying and maintaining quality products. Competition from male counter parts was the most important problem of women entrepreneurs. Lack of adequate transportation facilities was indicated as another major problem. While a few women sell the fish at the landing centre itself, for the rest, the next major challenge after procurement is to transport the fish to the market place. In many situations, vendors are usually denied access to public transport and sometime hiring auto rickshaws, or other forms of transport involving a significant expense in itself. Price fluctuations (88%), Lack of marketing facilities(86.8), Lack of infrastructure facilities (83.6%), Problems from consumer (72%), Unhealthy market places (64.8%) and Health problems associated with work (62%) were the other important problems faced by the fisherwomen respondents.

Strategies for Solving the Problems Faced By Fisherwomen

The respondents themselves were asked to suggest the solution for the problems they encounter during their fish marketing. The solutions are presented in table.

Table. 4. Strategies for solving the problems faced by fisherwomen

Sl.No	Strategies	Number	Percentage	Rank
1.	Adequate infrastructural facilities to be created	182	72.8	VI
2.	Good sanitation and awareness regarding different health problems	221	88.4	IV
3.	Hygienic market conditions to be ensured	210	84.0	V
4.	All basic amenities should be provided in the market	239	95.6	I
5.	Proper ways to be practiced for the supply of the products in markets with high demand	131	52.4	VIII
6.	Arrange cold storage and ice plants of good standards nearby.	236	94.4	II

7.	Government should come forward to publish market related information and also price regulation can be done by government intervention	229	91.6	III
8.	Special bus route for fisherwomen in the coastal area for to and fro travel to market for vending	171	68.4	VII

Source: Primary data

The table.4 shows that strategies for solving the problems faced by fisherwomen fish traders, all basic amenities should be provided in the market contributed first place, Arrange cold storage and ice plants of good standards nearby contributed second place and Proper ways to be practiced for the supply of the products in markets with high demand contributed last place.

Findings

- ❖ The study express that nine of the independent variables had a significant relationship with the dependent variable economic motivation and eight of them had a significant relationship with the other dependent variable risk orientation.
- ❖ The study express that the R and R² values. The R₁ and R₂ value represents the simple correlation is 0.552 and 0.504 respectively with dependent variables economic motivation and risk orientation.
- ❖ The study reveals that the regression model predicts the dependent variable significantly well. Here, p<0.0005, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.
- ❖ The study reveals that a major problem for majority of the respondents was lack of basic facilities in market places. This was followed by 95.2 % respondents complaining about lack of good storage facilities in the market. Competition from male counter parts was the most important problem of women entrepreneurs.
- ❖ The study reveals that strategies for solving the problems faced by fisherwomen fish traders, all basic amenities should be provided in the market contributed first place, Arrange cold storage and ice plants of good standards nearby contributed second place and Proper ways to be practiced for the supply of the products in markets with high demand contributed last place.

Suggestions

- ❖ Good hygiene must be maintained daily and must be ensured through regular checking.
- ❖ Basic infrastructural facilities such as clean toilets; access to potable running water; and adequate waste disposal measures must be provided with the help of government.
- ❖ The government should be arranged the cold storage and ice plants of good standards nearby the seashore.
- ❖ Government should come forward to publish market related information and also price regulation can be done by government intervention.
- ❖ The government should be arranging the special bus route for fisherwomen in the coastal area for to and from travel to market for vending area.

Conclusion

A fishery is a prime and growing sector in the Indian economy which has been registering consistent growth during the past few decades. The most important role of fisherwomen in both artisanal and industrial fisheries is at the processing and marketing stages. Women are

actively involved in the processing of fish catch, such as sun-drying, salting, smoking and preparing fish and fish-derived foods such as fish paste and cakes, either in cottage level industries, or as wage laborers in large scale processing industries. They are also normally the ones who subsequently sell the fish products. The study concluded that mostly, they are involved in fish marketing followed by housekeeping and fish processing. Women play significant roles in all aspects of fisheries; both in the artisanal, small-scale sector and in the commercial sector, yet their roles remain unarticulated and unrecognized. Though many schemes, projects, policies were framed, much stress or attention has not been given for proper implementation and execution. The present study has been undertaken to women fish trade entrepreneurs in Kanyakumari district-A study.

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Impact of GST on E-Commerce: A Pragmatic Study

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Abstract

E-Commerce Business is growing very quickly in India. It presently occupies third position after China and US. Earlier indirect tax laws created numerous perplexities and prosecutions and acted as a hindrance in the development of E-Commerce Business in India. Government too has lost a great deal of revenue due to improper linkages of different indirect taxes and tax evasion. Presently GST is supposed to control the loopholes existing in earlier indirect tax laws, rearrange the tax structure, lower overall tax rate. However impact of GST will be different for E-Commerce sector from the other sectors of the Economy. The fundamental objective of this paper is to evaluate the impact of GST on E-Commerce Business in India from the perspective of every interested party.

Key words: VAT, CST, Registration, Return, Service tax

Introduction

Indian E-Commerce industry is the third largest industry after China and US. It is growing at an average growth rate of 40% annually. For the last 2 to 3 years its growth rate is on the rise and is hovering around 60% Significant E-Commerce companies in India are Amazon, Amazon India, Flipkart, Snapdeal, Myntra, FirstCry.com, Home Shop 18, Shopclues, Jabong, ebay India, Naaptol, Yepme etc. The old indirect tax structures in India were obstacles in the growth of E-commerce industry. Actually old laws were not framed keeping as a main priority the online business. The provisions of VAT, Service tax, CST were creating perplexities and unending suits. In spite of huge growth of E-Commerce business in India, the growth in tax revenue to the Government from this sector was not encouraging. Meanwhile respective State Governments were additionally amending their VAT laws to plug the loopholes and leakages to revenue. The new GST law has been framed keeping as a main priority the requirements of online business. It is expected to remove disarrays and suits, plug the loopholes and increase the Government tax revenue from this sector.

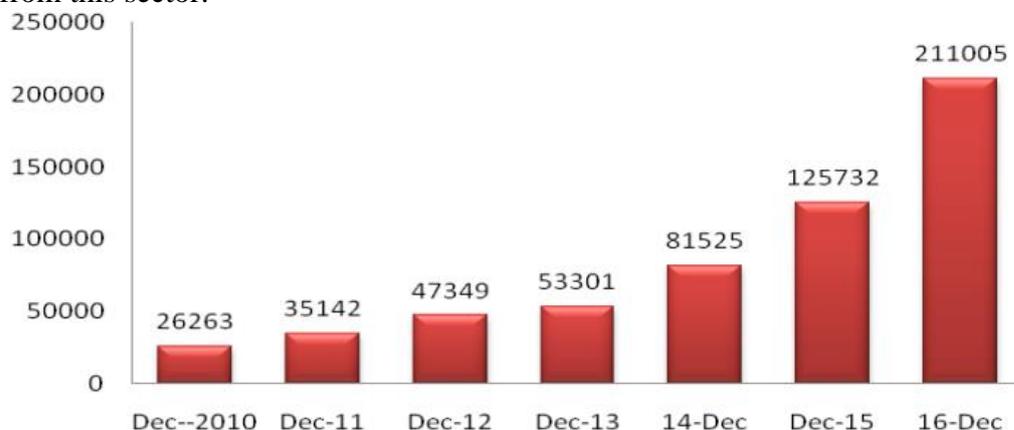


Figure 1.1 Revenue of E-Commerce Business in Rs. Crores

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Goods and Service Tax (GST)

The goods and services tax (GST) is a comprehensive indirect tax on manufacture, sale and utilization of goods and services. It was introduced as The Constitution (One Hundred and First Amendment) Act 2016, after the passage of Constitution 101st Amendment Bill. The GST is governed by GST Council and its Chairman is Union Finance Minister of India. Goods and services tax (GST) will subsume different central and state indirect taxes and other levies which are currently applicable on inter-state transportation of goods which are likewise likely to be done away with in GST regime. Let us take a glance at the different taxes which will be subsumed by the GST

Central taxes and levies

- i. Additional Custom Duty (ACD)
- ii. Special additional Duty of Custom(SAD)
- iii. Excise obligation
- iv. Service tax
- v. Central sales tax (CST)
- vi. Center-levied surcharge and cess related to supply of goods and services

State taxes and levies

- i. Value added tax (VAT)
- ii. Other state levies, for example, luxury tax, octroi, entry tax and purchase tax
- iii. State-levied surcharge and cess related to the supply of goods and services
- iv. Taxes on lottery, betting and gambling

There are certain taxes which have been kept outside the purview of the GST. They are mentioned below)

- i. Basic Custom Duty (BCD)
- ii. Stamp obligation
- iii. Taxes and duties on electricity
- iv. State excise obligation
- v. Taxes and duties on liquor for human utilization and amusement/entertainment/petroleum items until recommended otherwise by the GST board.

The GST board in its meeting in November, 2016 had agreed to a four rate structure under GST of 5, 12, 18 and 28 percent. While most services will be taxed at a higher rate of 18 per cent as against the current rate of 15 per cent, exceptions, for example, street transport are likely to continue which will be taxed at the existing rate that includes abatement. Some including education, health care and even pilgrimage related services will continue to enjoy exemptions. Experts likewise noted that the government has retained the power to levy cess on additional items under GST.

E-Commerce

An online marketplace is a type of e-commerce site where item or service informations are provided by multiple outsiders, whereas exchanges are processed by the marketplace operator. E-commerce is the essential type of multi-channel ecommerce and can be described as a "simple and convenient entryway" to streamline the generation process. In an online marketplace, consumer exchanges are processed by the marketplace operator and after that delivered and fulfilled by the partaking retailers or wholesalers (often called drop shipping). Other capabilities may include auctioning (forward or reverse), catalogs,

ordering, wanted advertisement, exchanging exchange usefulness and capabilities like RFQ, RFI or RFP.

These types of sites enable users to register and sell single items to a large number of items for a "post-selling" fee. In general, because marketplaces aggregate products from a wide cluster of providers, selection is typically wider, and accessibility is higher than in vendor-specific online retail stores. Likewise prices might be more competitive. Over the most recent couple of years ecommerce have thrived in India. Some have a wide variety of general interest products that cater to every one of the needs of the consumers; however, some are consumer specific and cater to a specific segment as it were. Is the stage for selling online, as well as the user interface and user experience matters? People tend to sign on to online marketplaces that are organized and products are significantly more accessible to them.

Objectives of the Study

Following are the Objectives of this study

- a. To make a comparative investigation of old indirect taxes and new GST applicable to E-Commerce Business in India
- b. To evaluate the impact of GST on E-Commerce Business in India from the perspective of every interested party

The taxability of e-commerce business under GST regime

As per GST law, E-Commerce means supply of goods or services or both including digital products over digital or electronic network and E-Commerce operator has been defined to mean any person who possesses, operates or manages such digital or electronic stage for E-Commerce. Under GST regime every E-Commerce operator and every supplier giving their goods or services through E-Commerce necessarily requires registration irrespective of threshold restrain. Further where consideration is collected by E-Commerce operator on behalf of supplier, it is likewise required to collect tax at source (TCS) not exceeding 1% on net value of taxable supplies after altering the value of taxable supplies returned amid the month. The said TCS is required to be deposited to the credit of Government inside 10 days from the end of the month in which it was collected. The Further, it has additionally been provided that in cases of notified services, the liability to pay GST will be of E-Commerce operator expecting it to be the supplier.

The impact of GST on different related parties in e-commerce business

Due to necessary registration, every rupee of supply of goods and services through ECommerce stage will pull in GST. Under the principal model VAT/CST will be replaced by GST and E-Commerce operator will be liable to pay GST on the supply of their own goods to the buyers. Under the second model, GST will be required to be paid on both the exchanges, the first between the E-Commerce operator and supplier and second between E-Commerce operator and buyer. Further, since in this model, the consideration is collected by E-Commerce operator, it will likewise be required to collect TCS from suppliers and deposit the same to the Government.

Under the third model, GST will be payable on commission charged by E-Commerce from the supplier and furthermore on value of supplies made by the supplier to the buyer. In the event that here the consideration is collected by E-Commerce operator on behalf of supplier then it will likewise be required to collect TCS from suppliers and deposit the same to the Government. In the fourth model, GST will be payable on commission in

addition to rentals charged by E-commerce operator from supplier and arrangement of TCS will likewise apply.

On account of C to C exchanges however, no GST will be payable because the exchange won't be in the course or furtherance of business. For example, no GST will be payable when one individual sells his old furniture to another person on OLX. In this way, the GST is expected to bring huge compliance burden regarding registration, returns, documenting statement of supplies and TCS returns for both E-Commerce operators and suppliers.

Implications of GST on E-Commerce

- It is compulsory for e-commerce operators/aggregators to register under GST irrespective of their turnover. Since e-commerce business model is to such an extent that seller expects orders from every one of the states, they are liable to get registration in all states.
- On the off chance that e-commerce operator does not have establishment in a state; his representative in the state will be liable to pay tax.
- Every e-commerce operator should collect tax @2% on net value of taxable supplies made through their stage, where the consideration, with respect to such supplies, must be collected by the operator.
- The planning for deduction of such sum by operator on account of real supplier of goods/or services will be earlier of time of credit of the sum to account of genuine supplier or time of payment in real money or some other mode to supplier, whichever is earlier.
- The sum collected by the operator is to be paid to the credit of appropriate Government inside 10 days after the end of the month in which the sum was so collected. Operator is additionally required to file a statement, electronically, containing details of all sum s collected by him.
- Place of supply in case of B2C exchanges would be the area of service provider and in case of B2B, it would be area of service recipient.
- It is critical for e-commerce business in India to become GST Compliant at the earliest and prepare to receive GST regulations without losing time.

Conclusions

The new GST law is supposed to stop revenue leakages as existed in earlier indirect tax law as the tax evaders will be gotten easily. It will likewise eliminate falling effect by ensuring seamless stream of credit from manufacturer to the trader. Since entry tax will likewise be subsumed in GST, overall tax burden will come down. Being the tax rate same in all states, the transportation and storage cost will come down. However, benefit of threshold restrict is neither available to E-Commerce operators nor to the suppliers. This will increase compliance burden of registration, returns, records and payments on the both E-Commerce operator and supplier. Further arrangement of TCS furthermore, high sales returns as a typical feature of e-commerce business will increase working capital requirement for small suppliers. In a nutshell, to survive in GST regime, the E-Commerce business should reformulate its business model and redefine its business strategies and processes.

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CSR in India: Challenges and Issues

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Abstract

Corporate Social Responsibility (CSR) has always been an integral part of Indian business houses either in the form of charity or donation. CSR has evolved a lot in India traversing through various phases of charity to being mandated in the country. CSR has gone through a radical change, its no more only fashion or mere slogan for corporate, it's the way of doing business now. The Interpretation of CSR has changed a lot in last decade. It has become an integral and strategic part of business nationally as well as globally. Over time it has emerged to cover economic, legal and social aspects of business. Ethics, sustainability and inclusive growth guide strategy and policies of company. Even though CSR is mandated in India but still the corporate faces lot of issues and challenges in implementing Corporate Social Responsibility in India. India being a vast country with population of 1.35 billion and more than 7000 listed corporate is considered as one of the fastest growing economies. However, it continues to face the challenges of malnutrition, poverty, corruption, inadequate healthcare, unemployment etc. In this backdrop this paper is an attempt to understand the challenges faced by Indian Corporate in implementing the mandated CSR law

Keywords: CSR; Section 135; Challenges and Issues; India; Fifth keyword

1. Introduction

Corporate social responsibility is all about conducting ones business in an ethical manner. It is giving back to the society in return of all the resources which it has used. CSR is a thus way of conducting business. CSR is incorporated in business ethics to pay back to all the stakeholders be it its internal or external stakeholders like customers, employees, suppliers, shareholders, government and public in large. CSR aspires to reward the society and other stakeholders with its direct concern for quality of life. CSR go beyond a corporate economic and legal responsibility and encompass its Social responsibilities. The word responsibility in itself is self- explanatory, which says that business has some kind of obligations towards the society in which it operates and it has to show concern for the social problems which goes beyond the economic services. Corporate social responsibility globally is understood as conducting of business in an ethical way and in the interests of the wider community and responding positively to society's priorities and expectations.

1.1 Define CSR

1.CSR According to Web "CSR is to embrace responsibility for the company's actions and encourage a positive impact through its activities on the environment, consumers, employees, communities, stakeholders and all other members of the public sphere who may also be considered as stakeholders."

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2. As per Mallen Baker “Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large”

3. CSR as defined by The World Business Council on Sustainable Development —”the commitment of business to contribute to sustainable economic development, working with employees, their families and local community and society at large to improve their quality of life.”

1.2 Objectives

1. To study the Implication of section 135, companies act 2013 on CSR in India.

2. To study the challenges and issues faced in implementing CSR in India.

3. To make suggestions for accelerating CSR initiatives.

2. Research Methodology: For in depth analysis of research study, this research paper is an attempt of exploratory research, based on secondary data. The data is sourced from literature review of journals, articles, books, magazines, government notifications and websites. Thus the researcher has extensively procured and analysed the data from secondary survey method.

3.1 CSR in India: CSR in India has come a long way from philanthropy and charity to Gandhiana philosophy of trusteeship to being mandated in India in 2013. CSR is not new for corporate, it has been Ubiquitous since antediluvian times. The growth of CSR can be divided into four phases. However the phases seem to overlap each other but have been ever evolving. The first phase is the phase of pre-independence era when CSR was mainly about charity and donations. This was followed by second phase wherein the main theme was Gandhiana philosophy of trusteeship. This was a era when Gandhi emerged as a Father figure and portrayed Indian companies as “ Temples of modern India” and motivated and encouraged them to manage their profits in a manner that benefits the society in large. Third phase is said to be between 1960 -1980. This is an era of mixed economy; witnessed emergence of Public sector undertaking .This is also the phase when labour and environmental laws and standards were set. Fourth phase witnessed globalization and liberalization and with this CSR abandoned its traditional roles and started engaging into activities which were more strategic and sustainable. And this phase witnessed the most paths breaking law i.e section 135 of companies Act 2013. With implementation of this law India became the first country in the world to Mandate CSR for certain strata of companies.

The focus of government is on CSR law and lot of amendments and changes have been made ever since incorporation and implementation of the law. The law under section 135 of companies act 2013 mandates “Every companies having Net worth of INR 500 crore or more; or Turnover of INR 1000 crore or more; or Net Profit of INR 5 crores or more during any financial year will have to constitute corporate social responsibility committee and policy with effect from April 1st 2014”. The said corporate has to spend 2% of its average net profit of preceding three years in CSR activities as prescribed in Schedule VII of companies Act ,2013.

Under schedule VII of the Act, law guides the corporate by listing the sectors and areas where they can invest in CSR activities. The Law states that a corporate can implement CSR in three possible ways.

i) Either on its own – in house department – company foundation.

ii) Partnering with an implementing agency which can either be Trust, section 8 company or a registered society.

iii) Grants to CSR projects of other corporate, NGO or as specified in Schedule VII of companies Act, 2013.

For a Corporate, its current professional human resource, budget for CSR, cost of project and implementation, availability of implementing partner, political interventions, state government and local leader's pressure etc are the major factors, which it considers while opting for a in-house implementation or partnering with an implementing partner. Analysis of Current trend in CSR expenditure, by big corporate, proves that spending money is as difficult as earning it for corporate especially when it comes to CSR. Research proves that most of the top companies have unspent CSR budgets every year. The top reason being non-availability of Implementing partner and well defined projects. As per reports of ASSOCHAM nearly 67% of corporates choose an NGO as a partner for implementing its projects. Similarly another report by CBI submitted to CBI there are around 20 lakhs NGO operating in India. Despite so many NGO operating corporate fail to find an eligible partner to work with. This is because of lack of trust between the two on the aspects of accountability, transparency and competency. While it is true that all NGO are not competent and trustworthy but this is also proven that many NGO work at grass root level and bring more than the desired impact. Similarly corporate are blamed that they fund their in-house foundation, and often these funds find their way back to parent organisation in one way or other.

3.2 Challenges and issues of CSR in India: Researcher found that though a lot has been done in the arena of CSR in India but still corporate face lot of challenges and issues in the implementation of CSR. The major one's are as following:

1) Legislative guidelines: In the past also, government had to rely on legislation for regulating the businesses in delivering social and environmental objectives. With implementation of section 135 of companies act 2013, now there's a tight rope on which corporate have to walk on in terms of CSR. A fixed budget, declaration in website and annual reports, formation of CSR committee and policy, identification of implementing partner, formulation of project in a program mode etc are few of the mandates of company's act 2013.

2) Duplication of CSR activities: It's very difficult to have consensus among local agencies regarding the CSR interventions and projects taken up by government and corporate. As a result it leads to duplication of CSR activities. Thus, instead of having a collaborative approach, often implementing agency are found to be competing with each other on achieving a common objective.

3) Mapping Impact Assessment: The duplication of activities further leads to difficulty in mapping the Impact assessment of the projects undertaken by the corporate. As different agencies strive to provide similar kind of solution to nearly same set of beneficiaries. It's also because most of the CSR activities are concentrated in urban areas and reach to far off rural and remote areas is limited.

4) Non-participation of Local Community: The local community is often found disinterested and non-participative in the CSR activities. The reason can be attributed to the fact that there's hardly any awareness among local community regarding the CSR, as no serious efforts have ever been made to create awareness and instil confidence in the community regarding such initiatives. The problem is often aggravated because of lack of

communication between corporate and community. The corporate instead of doing themselves hires the Implementing agency for the project, which often ignores the power of communication.

5) Need Assessment: CSR law mandate that activities have to be in project and program mode, which requires need identification of the concerned community, but more than often the implementing agency choose to work on areas in which they have expertise instead of focusing on needs of community. So the spirit of law is lost somewhere in the process.

6) Reach of NGO: Moreover, Its found that the reach of non-government organization is limited in rural and remote areas, as a result they are not able to assess the real needs and gaps of the community which further leads to failure in implementation of real intentions and achieving objectives of the projects. This further leads to failure in development of capacities at local levels.

7) Transparency issues: Local implementing agencies are not as transparent as they are expected to be. They often fail to disclose and openly discuss audit issues, impact assessment reports and methodology, fail to provide fund utilization certificate etc. Due to lack of transparency, trust building between corporate and NGO is jeopardize. Without trust building it's not possible to have effective CSR programs and implementations.

8) Lack of Local Capacities: There is a dire need for building local capacities of the local nongovernmental organizations, as there's lack of trained and experienced organizations which can contribute to the needs of CSR programs as envisioned by the corporate. As a result scaling up of CSR initiatives is compromised and subsequently it limits the scope of such activities.

9) Lack of Non-governmental Organizations in rural areas: It is found that there is non availability of qualified nongovernmental organizations in the rural and remote areas of country that which can assess and identify the real needs of the community and can actually help in real implementation of CSR interventions of corporate. This scenario again reinstate that government as well as corporate has to focus on building local capacity for better implementation of CSR programs of corporate.

10) Lack of CSR professional: CSR teams in most companies are headed by people with corporate communications or HR background. These teams are usually small and get little time to update themselves with the Social, Environmental & Economic Canvas of India. This, and the pressure on these teams to please every branch or location with some CSR budget, means that of the 660 districts of India, only 100 odd districts gets CSR funding. Sadly, the activity does not reach the really backward areas.

11) Clash in Policy of MNC with local motives: Though MNC often claims they "think global but act local" but often they have failed in implementing this thought process. More than often they are found imitating their global policies on sustainability and social issues thereby ignoring the needs of country they are actually operating in. India has its unique needs due to vast population and size of country and corporate are expected to consider those while framing its policies.

12) Audit requirements: Most of the time corporate not only leave the job of need identification and project formulation and implementation to its implementing partner but also the task of auditing is left to the same NGO, as a result often the real beneficiaries are not tapped and real impact is not measured. Besides many corporate have the policy of not supporting a NGO for more than 3 years which further demotivate the NGO and as a result

their full potential is not put to use. More often than not the NGO are found vying for new funders to support their projects.

13) Project and program mode: The Law states that a CSR project has to have a start and end date, it can not continue forever. Though the basic idea is good to create sustainability of project but often it hampers impact of program as “How on earth, can you ever arrive at the impact of your money, which supported a student only for three years!” Besides CSR strategy of affirm has to be conducted through series of projects. Each of them has to have a well defined beginning, end, baseline survey, Impact assessment, expected output and a dedicated budget as well. Moreover corporate has to decide if it will go for project development and implementation on its own or a Implementing partner will do so. Which ever path corporate takes it needs to well define the project. Different projects have varying duration some are short extending to few months to long duration projects extending to multi year. In this scenario each project has to have annual reviews and reporting. Understanding these project complexity and managing multiple project in itself becomes a challenge for corporate.

14) Employee Volunteerism: An important component of CSR is employee volunteerism. But more often than not corporate fail to use it to their best and limit volunteerism only to a day or 2 celebrated as world community day. Corporate fail to explore and utilize the benefits and competency of their employees which can fetch much better social returns if utilized strategically.

15) Relations with the suppliers: With the change in current social and legal environment many stakeholders are increasingly becoming aware and interested in business affairs of corporate. As a result corporate have become conscious of not only theirs but also their partners conduct in a socially responsible manner. Infact many of them are now introducing socially responsible code of conduct to ensure that supplier's policies or practices do not negatively impact the reputation of corporate.

16) Limitations of schedule VII: If Corporate consider only the activities as prescribed in schedule vii of companies act 2013 (section 135) as CSR, then what about corporate support for issues not covered under this schedule? Should then the corporate stop their on going CSR activities and projects, and focus only on mandated areas? The Non government organisation and the communities they support could find themselves stranded if this happens. Besides Schedule VII does not provide a mutually exclusive list of activities. For example Health and sanitation is one area, Woman empowerment is Poverty alleviation yet another, Promotion of education comes under separate heading. Now if a corporate runs a school for skill development and education of rural women, it can be considered under empowerment, education as well as eradicating poverty. Thus their need to be more clarity on this aspect.

17) Key performance Indicators for CSR review: The CSR activities need to be evaluated after implementation so as to find out whether desired results have been achieved or not. Most of the time corporate look for performance in quantitative term and qualitative aspect is neglected, whereas in social projects qualitative performance is more relevant. The corporate are used to evaluate everything from the point of view of business. This analysis of output has to change.

18) Geographical Biasness: The law asks the corporate to invest in CSR preferably in the local area of its working. As a result most of the development is in industrial areas and states with industries .For example government data shows that states of Gujrat,

Maharashtra, Andhra Pradesh, Tamil Nadu and Rajasthan have witnessed nearly 25% of all CSR expenditure of country whereas states of north east are completely ignored.

4. Conclusion: In order to overcome the issues and challenges of CSR, certain steps need to be taken. Government, corporate and civil societies the pillars of sustainability and inclusive growth has to make a joint effort to create awareness in the society and community about CSR. This will help in participatory CSR and will be more effective and efficient. Besides the baseline surveys, need identification will be more pronounced, which will lead to well defined CSR projects. This will not only bring change in people's attitude towards CSR intervention but will also positively affirm a firm's role. Such kind of efforts will have a multi dimensional impact. Other corporate would be willing taking up CSR and invest in communication, it would be easier to convince and motivate suppliers to follow a code of conduct and implementing agencies will get the message of being more transparent and honest in their efforts. Thus, eventually the agenda of CSR would be addressed more meaningfully. An effective partnership between all the stakeholders needs to be created. Both corporate houses and NGO must actively deliberate and participate in building local capacities and reaching to far off remote and rural areas where the CSR is much needed. This will help in scaling up of CSR projects and reaching out to more beneficiaries. This will further help in reducing the problem of duplication of projects by various corporate. The government can plan to reward or give recognition to corporate doing good CSR. It will motivate others to follow the footsteps and collaborative impact would be expected. Though universities and schools are including ethics, sustainability as a part of curriculum but still much has to be done. The subject of CSR should be made compulsory and courses on specialization on the field should be taken up by management Institutes. The subject of CSR can be studied as an independent field like Human Resource, marketing and finance. This kind of effort will generate pool of well trained resource and better and innovative solutions in the field will be generated.

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“Improvement of Throughput DEEC Routing Protocol For UAV SWAM Based Wireless Sensor Networks”

Amul Batra*

Abstract

UAV Swam based wireless sensor network is composed of hundreds and thousands of small flying wireless sensor nodes which collect information by sensing the physical environment. The sensed data is processed and communicated to other sensor nodes and finally to Base Station. So energy efficient routing to final destination called base station is ongoing current requirement in wireless sensor networks. Here in this research paper we propose a multi-hop DEEC routing scheme i.e. Threshold DEEC for heterogeneous networks like UAVs Swam where we deploy rechargeable intermediate nodes called gateways in-between cluster head and base station for minimizing energy consumption by sensor nodes in each processing round thereby increasing the network lifetime and stability of wireless sensor networks unlike DEEC.

Keywords— *Unmanned Aerial Vehicle, Wireless Sensor Networks, Heterogeneous Protocol, Gateway, DEEC, and Energy Consumption.*

I. Introduction

Recent advancement in wireless communication and electronics has enabled the development of low-cost, low-power multifunctional miniature devices for use in remote sensing applications. Such sensors can be widely deployed for commercial, civil and military applications such as UAVs Swarm networks, surveillance, vehicle tracking, climate and habitat monitoring intelligence, medical and acoustic data gathering. A WSN is composed of large number of sensor nodes which consist of sensing, data processing and communication capabilities. Usually sensor nodes are scattered in the sensing field. They coordinate among themselves to get information about the physical environment. The information is routed to the Base Station either directly or through other sensor nodes. The BS is either a fixed or mobile node which is capable to connect the sensor network to the internet where user can access and process data. The key challenge in sensor networks is to maximize the lifetime of sensor nodes due to the fact that it is not feasible to replace the batteries of thousands of sensor nodes. Therefore, computational operations of nodes and communication protocols must be made as energy efficient as possible. Area coverage and data aggregation [1] techniques can greatly help conserve the scarce energy resources by eliminating data redundancy and minimizing the number of data transmissions. Therefore, data aggregation methods in sensor networks are extensively investigated in the literature [1], [2], [3] and [4].

Considering the challenges of WSN many routing protocols have been already proposed for WSN. They can be classified into flat, hierarchical and location-based network routing. In flat routing all nodes are typically assigned equal roles or functionality. SPIN (Sensor Protocols for Information via Negotiation) and DD (Directed Diffusion) fall in this category. In hierarchical routing the network is divided into clusters to achieve energy efficiency. LEACH [5], TEEN [3], APTEEN [3] are well known hierarchical routing

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protocol. In location based routing exact position of a node is used to find the optimal routing path e.g. GAF (Geographic Adaptive Fidelity) [4] and GEAR (Geographic and Energy Aware Routing) [5].

II. Wireless Sensor Network

Wireless sensor networks are potentially one of the most important technologies of this century. Recent advancement in wireless communications and electronics has enabled the development of low-cost, low-power, multifunctional miniature devices for use in remote sensing applications. The combination of these factors have improved the viability of utilizing a sensor network consisting of a large number of intelligent sensors, enabling the collection, processing analysis and dissemination of valuable information gathered in a variety of environments. A sensor network is composed of a large number of sensor nodes which consist of sensing, data processing and communication capabilities.

III. Sensor Network Challenges

Wireless sensor network uses a wide variety of application and to impact these applications in real world environments, we need more efficient protocols and algorithms. Designing a new protocol or algorithm address some challenges which are need to be clearly understood [6]. These challenges are summarized below:

Physical Resource Constraints: The most important constraint imposed on sensor network is the limited battery power of sensor nodes. The effective lifetime of a sensor node is directly determined by its power supply. Hence lifetime of a sensor network is also determined by the power supply. Hence the energy consumption is main design issue of a protocol. Limited computational power and memory size is another constraint that affects the amount of data that can be stored in individual sensor nodes. So the protocol should be simple and light-weighted. Communication delay in sensor network can be high due to limited communication channel shared by all nodes within each other's transmission range.

Ad-hoc deployment: Node deployment in WSNs is application dependent and affects the performance of the routing protocol. The deployment can be either deterministic or randomized. In deterministic deployment, the sensors are manually placed and data is routed through pre-determined paths. However, in random node deployment, the sensor nodes are scattered randomly creating an infrastructure in an ad hoc manner. If the resultant distribution of nodes is not uniform, optimal clustering becomes necessary to allow connectivity and enable energy efficient network operation. Inter-sensor communication is normally within short transmission ranges due to energy and bandwidth limitations. Therefore, it is most likely that a route will consist of multiple wireless hops.

IV. 2.1 Routing protocol in wireless sensor network

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Energy-Efficient Routing Protocols in Wireless Sensor Networks: A Survey Nikolaos A. Pantazis, Stefanos A. Nikolidakis and Dimitrios D. Vergados, Senior Member, IEEE

During the recent years, many energy efficient routing protocols have been proposed for WSNs. In the above paper author mention the following energy efficient routing protocol for wireless sensor network

Data-centric protocols: In many applications of sensor networks, it is not feasible to assign global identifiers to each node due to the sheer number of nodes deployed. Such lack of global identification along with random deployment of sensor nodes makes it hard to select

a specific set of sensor nodes to be queried. Therefore, data is usually transmitted from every sensor node within the deployment region with significant redundancy.

2.1.2 Sensor Protocols for Information via Negotiation: (SPIN) [7] is among the early work to pursue a data-centric routing mechanism. The idea behind SPIN is to name the data using high level descriptors or meta-data. Before transmission, meta-data are exchanged among sensors via a data advertisement mechanism, which is the key feature of SPIN. Each node upon receiving new data, advertises it to its neighbors and interested neighbors, i.e. those who do not have the data, retrieve the data by sending a request message. SPIN's meta-data negotiation solves the classic problems of flooding such as redundant information passing, overlapping of sensing areas and resource blindness thus, achieving a lot of energy efficiency.

V. Proposed Protocol

Working of the protocol

A lot of simulation works / experiments are going on in the research field of WSN to make routing protocols more and more energy efficient. Here, we propose a modified version of DEEC called Improved DEEC that can increase energy efficiency than original DEEC. The basic concept involved in increasing energy efficiency is to keep radio communication distance as minimum as possible [8]. The popular technique used to minimize communication distance is the formation of clusters between nodes rather than direct communication [9] but as the distance between the CH and BS go beyond a certain level single hop communication concept of DEEC routing protocol is not suitable. For this we propose Heterogeneous Multi-hop DEEC routing protocol to increase the energy efficiency of WSN.

As we mentioned earlier, DEEC considers all sensors in the network have the same amount of initial energy i.e. they are homogeneous with respect to energy which is not realistic approach. So the nodes which directly communicate with the BS (i.e. the CHs) will die earlier than the normal cluster member nodes, decreasing the overall lifespan of the network. To make the network more energy efficient we classify the sensors into three types: normal node, intermediate node and advanced node depending on their initial energy level. The advanced node has the highest energy level while the normal node possesses the lowest level of energy. The normal nodes will be the cluster members. They send their data to their CH which will be elected from the group of intermediate nodes. The procedure used to select CH is same as that of DEEC. The intermediate nodes will also sense data from the environment. They will aggregate the sensed and received data and either send it to one of the advanced nodes located nearer to BS or send directly to the BS if no such advanced node is found. The advanced node communicates directly with the BS. It also senses data and aggregates all the data it received from different intermediate nodes with its own data. Finally it transmits the data directly to the BS.

VI. Energy Efficiency of Proposed Protocol

Our proposed algorithm provides better connectivity and successful data rate as compare to DEEC. The reason behind this enhancement is multi-hop communication adopted by cluster-heads. As member nodes save energy by sending data to cluster-head in DEEC instead of Base station, similarly in Improved DEEC cluster-head at longer distance from Base station transmit data to advanced nodes closer to the Base station instead of direct transmission to Base station. It is more effective energy efficient routing protocol when network diameter is larger. Energy efficiency of Improved DEEC can be better elaborate

with the example of linear network having two cluster heads A and B which are communicating to Base station. A is at a distance 'm' from B and B is at a distance m from the Base station.

In order to calculate the transmitting energy cost of cluster heads A and B, which are directly transmitting to Base station will be [10]:

$$E_{dirAB} = E_{eleTX} \times L_A + E_{amp} \times L_A \times 2m^2 + E_{eleTX} \times L_B + E_{amp} \times L_B \times m^2$$

Where E_{dirAB} is total energy cost of cluster-heads A and B, L_A is aggregated data transmitted by cluster-head A and L_B is aggregated data transmitted by cluster-head B towards Base station and m is equal distance among cluster heads and Base station. This happens in case of DEEC when every cluster-head has to communicate directly to Base station.

Similarly total transmitting energy cost can also be calculated when multi-hop communication is taking place. Our proposed protocol utilizes multi-hop communication. In this linear network if cluster-head A transmits data to B instead of Base station then B has to transmit not only its own data but also has to transmit cluster-head A's data to Base station.

$$E_{Multi-hop} = E_{eleTX} \times L_A + E_{amp} \times L_A \times m^2 + E_{eleRX} \times L_A + E_{eleTX} \times (L_A + L_B) + E_{amp} \times (L_A + L_B) \times m^2$$

VII. Performance Analysis of Energy-Efficient Routing Techniques in Wireless Sensor Network

For even moderately-sized networks with ten nodes, it is impossible to analytically model the interactions between all the nodes. Therefore, simulation was used to determine the benefits of different protocols. Computation and communication energy dissipation models as well as new MAC algorithms were implemented in matlab to support the design and simulation of the different protocol architectures. In this section DEEC is compared to the proposed algorithm in terms of system lifetime, energy dissipation and amount of data transfer.

VIII. Simulation Setting

A simulation environment is designed and implemented in MATLAB 7.10.0 in order to investigate the energy efficiency with lifetime extension of the mentioned protocol. We compare the proposed Modified Leach algorithm with Leach routing protocol. The simulation parameters used in the experiment is shown in Table 3.1. The nodes are randomly distributed between $x=0, y=0$ and $x=100, y=100$ with the base station (BS) at location $x=50, y=50$. BS and all sensor nodes are stationary after deployment. We consider packet size of 2000 bits. The simulation parameters are summarized in Table 3.1.

IX. Network lifetime

It is the time interval from the start of the network operation till the last node die.

Throughput:

To evaluate the performance of throughput, the numbers of packets received by BS are compared with the number of packets sent by the nodes in each round.

Parameter	Value
Network Size	100m * 100m
Number of nodes	100
Packet Size	2000 bits
Initial Energy	0.5 j
Number of rounds	5000
Transmitter Electronics (ETX)	50nJ/bit
Receiver Electronics (ERX)	50nJ/bit
Data Aggregation Energy	5nJ/bit

Table 3.1: Characteristics of the test network

X. Simulation Results

The simulated protocols are briefly summarized here. In DEEC, nodes organize themselves into clusters using the distributed algorithm described in chapter 3.1. This protocol has the advantage of being distributed, self-configuring and not requiring location information for cluster formation. In addition the steady-state protocol is low-energy. However, the drawback is that there is no guarantee as to the number or placement of cluster-head nodes within the network and number of cluster members within a cluster.

Protocol	Rounds when nodes start dying	Rounds when all nodes are dead
DEEC	0	2100
Improved DEEC	0	2200

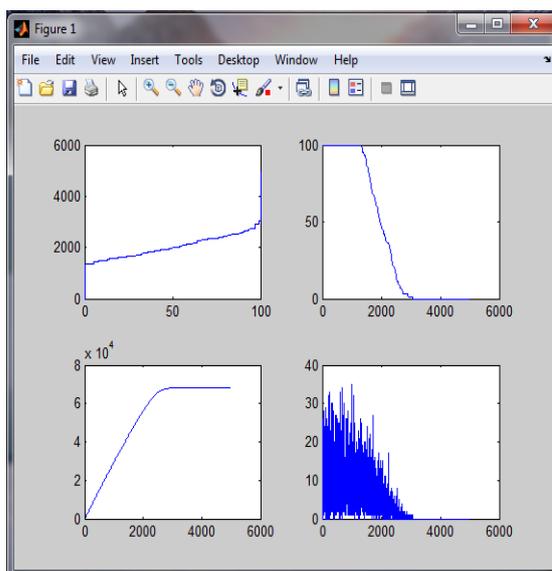


Fig 3.3.1 THRESHOLD DEEC Output result

XI. Conclusion

Use of the wireless channel is growing at an amazing speed. Advances in energy-efficient design have created new portable devices that enable exciting applications for the wireless channel. While the wireless channel makes deployment task easier, it adds constraints that are not found in a wired environment. Specifically, the wireless channel is bandwidth-limited, and the portable devices that use the wireless channel are typically battery-operated and hence energy-constrained. In addition, the wireless channel is error-prone and time-varying. Therefore, it is important to design protocol and algorithms for wireless networks to be bandwidth and energy-efficient as well as robust to channel errors. The work described in this dissertation shows an energy-efficient routing technique which is mainly suitable for application like environment monitoring where sensor nodes located in nearby region collect similar type of data

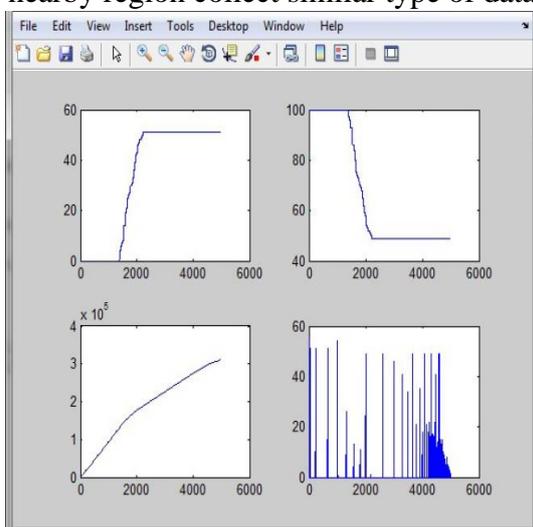


Fig 3.3.2 Improved DEEC Output

XII. FUTURE Work

There is still much work to be done in the area of protocols for wireless micro sensor networks. The protocols described in this dissertation are for scenarios where the sensors have correlated data. However, there are important applications of wireless sensor networks where this is not the case. For example, sensor networks for medical monitoring applications may have different sensors located on and/or in the body to monitor vital signs. These networks will not be as large-scale as the ones discussed, but they will have similar requirements to the sensor networks discussed – long system lifetime, low-latency data transfers and high quality data. These networks will most likely focus on maximizing quality above all parameters and loss of information will not be acceptable. Therefore protocol architectures need to be developed to support the unique considerations of these networks.

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UBIQUITOUS COMPUTING

Palvi-mca, mphil*

Abstract

Although a ubiquitous computing has been widespread and Computers embedded into physical objects and living environments have been increased, personal portable devices are still necessary for various interactions with embedded computers. Despite of importance of those devices, input and output capabilities of them are limited and relatively impoverished compared to those of laptop computers. Moreover, users must pay an explicit attention to an interaction with portable devices. To solve these problems, we propose a smart device collaboration for a ubiquitous computing, which aims to realize that each embedded computer complements the lack of capability of a portable device in the ubiquitous computing environment. Our proposed smart device collaboration allows users to have appropriate interactions with embedded computers, without explicit attentions to existences of these computers and interfaces to them. This paper describes InfoPoint and Smart Furniture which are our experimental devices demonstrating smart device collaboration. We also observe advantages and disadvantages of these devices, present future works, and conclude a scheme of the smart device collaboration.

Introduction

Ubiquitous computing (or "ubicom") is a concept in software engineering and computer science where computing is made to appear anytime and everywhere. In contrast to desktop computing, ubiquitous computing can occur using any device, in any location, and in any format. A user interacts with the computer, which can exist in many different forms, including laptop computers, tablets and terminals in everyday objects such as a refrigerator or a pair of glasses. The underlying technologies to support ubiquitous computing include Internet, advanced middleware, operating system, mobile code, sensors, microprocessors, new I/O and user interfaces, networks, mobile protocols, location and positioning, and new materials.

This paradigm is also described as pervasive computing, ambient intelligence,¹ or "everyware". Each term emphasizes slightly different aspects. When primarily concerning the objects involved, it is also known as physical computing, the Internet of Things, haptic computing and "things that think". Rather than propose a single definition for ubiquitous computing and for these related terms, a taxonomy of properties for ubiquitous computing has been proposed, from which different kinds or flavors of ubiquitous systems and applications can be described.

Ubiquitous computing touches on a wide range of research topics, including distributed computing, mobile computing, location computing, mobile networking, context-aware computing, sensor networks, human-computer interaction, and artificial intelligence.

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Ubiquitous computing may be seen to consist of many layers, each with their own roles, which together form a single system:

Layer 1: task management layer

- Monitors user task, context and index
- Map user's task to need for the services in the environment
- To manage complex dependencies

Layer 2: environment management layer

- To monitor a resource and its capabilities
- To map service need, user level states of specific capabilities

Layer 3: environment layer

- To monitor a relevant resource
- To manage reliability of the resources

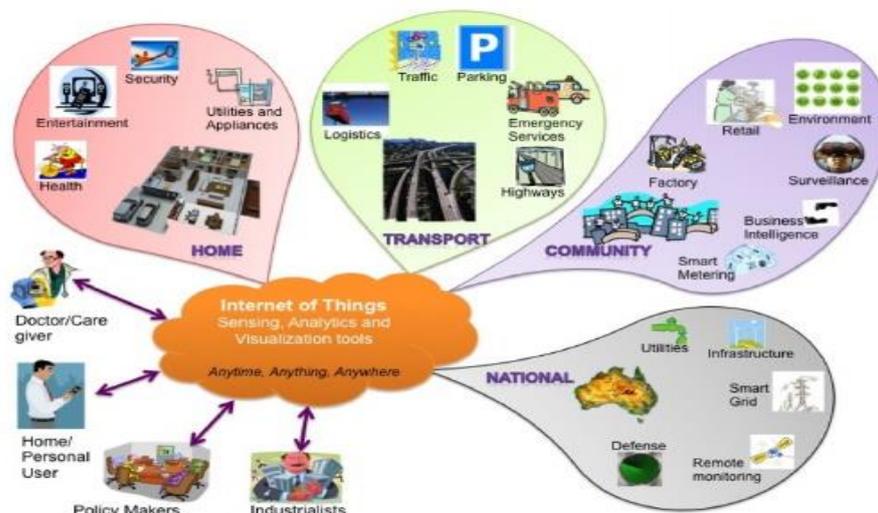


Fig. 1. Internet of Things schematic showing the end users and application areas based on data.

History

Mark Weiser coined the phrase "ubiquitous computing" around 1988, during his tenure as Chief Technologist of the XeroxPalo Alto Research Center (PARC). Both alone and with PARC Director and Chief Scientist John Seely Brown, Weiser wrote some of the earliest papers on the subject, largely defining it and sketching out its major concerns.^{[6][7][8]}

Key features of ubiquitous computing include:

- Consideration of the human factor and placing of the paradigm in a human, rather than computing, environment.
- Use of inexpensive processors, thereby reducing memory and storage requirements.
- Capturing of real-time attributes.
- Totally connected and constantly available computing devices.
- Focus on many-to-many relationships, instead of one-to-one, many-to-one or one-to-many in the environment, along with the idea of technology, which is constantly present Includes local/global, social/personal, public/private and invisible/visible features and considers knowledge creation, as well as information dissemination.
- Relies on converging Internet, wireless technology and advanced electronics.
- Increased surveillance and possible restriction and interference in user privacies, as the digital devices are wearable and constantly connected.
- As technology progresses, the reliability factor of the different equipment used may be impacted.

Impact of Ubiquitous Computing

- Ubiquitous computing will permeate everyday life – both private and working – and is therefore expected to have Far-reaching consequences that will be reflected in a variety of socio-economic contexts. Both positive and negative effects are likely in equal measure at several levels. Safety and privacy, for example, make up two ends of one key

Impact on privacy: in terms of privacy, slightly positive effects are expected for the application fields of Security, medicine and production; moderately negative effects are expected in other application contexts.

- A ubiquitous computing design for privacy that conforms to data protection standards is regarded as a requirement for ensuring Privacy and is preferred to the downstream concept of context-dependent data protection filters (digital bubbles).
- Only a system architecture that protects privacy from the outset can prevent serious conflicts in data protection from developing.
- In the use and processing of data, rendering all steps in the process visible and logically comprehensible seems to be of less importance.
- Far more crucial is a user's explicit trust in a particular ubiquitous computing system that the service provider will handle personal data responsibly.
- Apart from this concern, there is the danger that frequent use of a ubiquitous computing application could potentially lead to the inattentive handling.
- Ubiquitous Computing: Potentials and Challenges **1327** of personal data.
- This means that the premature availability of a ground breaking ubiquitous computing application could result in limited public attention being given to the protection of privacy during its crucial phase of implementation.

Economic impact: among the economic effects associated with ubiquitous computing, work efficiency in particular is expected to improve. This will become most apparent in the

key economic areas of production, Logistics and commerce. This will not, however, play a role in smart homes.

- It is worth noting that no significant efficiency gains from ubiquitous computing are expected for housework, professionals working at home, and Homecare of the elderly and/or ill.
- The motivation for introducing ubiquitous computing into the smart home is to Increase personal comfort, which is not quantifiable in economic terms.
- Experts apparently anticipate effects similar to those resulting from the introduction of modern household appliances during industrialization.
- Back then, the time saved by the use of new appliances was counteracted by increased demands in hygiene and cleanliness, which resulted in extra work.
- Moderately positive effects are anticipated for increasing energy and resource efficiency in all areas of application.
- Significant increases are expected, however, in production and especially logistics. Indeed, the potential of ubiquitous computing for commerce and production is immense because of its ability to self organize and control industrial processes.
- Such self-organization depends on several things, including the availability of fully developed knowledge-based systems. Developing these systems in turn, however, poses a significant challenge.
- Finally, newly adapted recycling procedures will be needed to allow for the re-use of ubiquitous computing Components that have been integrated and embedded into everyday objects.

Social impact: clear positive effects are predicted in the personal activities in medicine, the home, communications and automobiles, while moderately positive effects are expected in inner and external security, and in production, logistics and commerce.

- Improvements in safety are anticipated primarily in military and security-related applications, especially in medical applications. The automotive branch will also profit.
- Overall, ubiquitous computing is not expected to produce any negative *rebound effects*, which would offset or even negate its positive effects.
- This is true for work and attention efficiency, resource consumption and for the ability of human being to orient and locate himself in his environment.

Winners and losers: there will be several social groups as winners and losers in ubiquitous computing.

- The elderly and persons with little experience with technology stand out as groups that could benefit from ubiquitous computing and be disadvantaged by it as well.
- How might this paradox come about? The first generation ubiquitous computing applications are likely to demand a certain level of knowledge and requirements that will result in a temporary division between the winners and the losers.
- However, this divide should subside as the functional logic of later generation ubiquitous applications is automated and cost-effective mass production sets in.
- Once the technology matures and becomes publicly available, the less educated will begin to profit from it.
- It is, therefore, imperative that a ubiquitous computing infrastructure offers accordingly easy access in technical, Financial or intellectual terms. Otherwise, a digital divide between those with and those without access to ubiquitous computing will emerge.

- Other groups that could suffer disadvantages as a result of ubiquitous computing include small businesses and retail, political minorities, critics or skeptics, marginal groups and persons with unusual backgrounds.

Ubiquitous Computing Devices and Technologies in Educational Environments

Several studies, have tried to explore the use of mobile devices in education. Koole, points Out that m-learning is the intersection of three compounds: the device/technology aspect, the student's characteristics, and the social aspects. Crow et al. Conducted a study on the use of mobile devices in higher education using semi-structured interviews with three lecturers. They concluded that there are three criteria that are necessary for "switching gears" from e-learning to m-learning: instructor's awareness of opportunities, instructor's familiarity of new mobile devices and software applications, and institutional support and commitment. Recently, Renneberg et al. [37] studied the m-learning adoption in tablet devices instead of cell phones and PDAs. Tablets' screen size allows better visualization, enabling user interaction. Although tablets overcome the barriers of small screens, they still have limitations on storage capacity, input capabilities, and reliability. Lessons learned from teaching network application design to students using smart phones and cloud computing are reported in [38]. Students were motivated to learn independently, when they were free to develop their preferred mobile applications, and they collaborated to openly share code with each other. It seems that Smartphone technology excites students about computing and networking. Richards [39] attempts to merge the principles of universal design for learning with ubiquitous learning, in order to reduce the barriers for students with disabilities and learning difficulties. The first principle is to provide multiple means of representation. Ubiquitous learning provides learners the means to adapt contents according to their needs. The second principle is to provide multiple means of action and expression. This principle is fulfilled,

For example, through the mobile use of social media where students can actively express themselves and interact with the leaning content. The third principle is to provide the means of engagement, which is fulfilled by all mobile applications in the instructional context. Social bookmarking sites, for example, allow students sharing their findings and adding a peer networking capability to the learning process. In the following, we discuss the requirements captured by interviews with educators and students. We also outline the functional components of the integrated system along with a short description of their role and their interaction between each other through a representative use case.

3.1. Interviews

Our pedagogical, m-learning and blended learning based teaching activities in Higher Education are part of a three years experiment in the Department of Informatics of the TEI of Athens aimed specifically at fulfilling the inclusion and support of students through mobile devices technology, and content delivery in the mainstream class and in parallel classes. Special emphasis was given to the inclusion of students with disabilities and learning difficulties. Twenty persons were participated in a voluntary basis. In particular, five instructors, a social worker, expert in Special Education, with good knowledge of the Sign Language, and fourteen (14) students (hearingnotes' takers, deaf and hard of hearing students, and dyslexic students) worked in special parallel, "assistive", classes. The participating students also attended the same courses in the mainstream classes. Parallel classes were organized for the following courses: Databases I & II, Introduction to Programming (Pascal language), Programming (C language), Numerical Analysis and

Introduction to Informatics. Interviews with people and the experts in the program helped us to give proposals on the utilization of mobile devices and ubiquitous computing technology in the higher education classroom of the future. As a consequence, a new programme is funded in order to create the new integrated system for supporting students of the TEI of *Catherine Marinagi et al. / Procedia - Social and Behavioral Sciences 73 (2013) 487 – 494* 491

Athens –mainly disabled students and students with learning difficulties- in the class and the laboratory using mobile technology and specialized software (e.g. text-to-speech).

We conducted semi-structured interviews to capture the experiences of the twenty (35) participants. Main findings of our research suggest the following interrelated directions of development for the integrated system of supporting the future classroom:

∞ A student-centered, personalized, adaptive to the specific needs approach. It also means that there are not barriers in the inclusion and participation of all the students; the disabled students are supported; and there is not any obligation of physical presence in the classroom. Fulfill the demand for resources, technical support and training to offer a basis for the understanding and adoption of the new technologies for instructional purposes.

∞ Inclusion is related to the increased demand for interactivity, personalization and adaptation support, dissemination of information, and the Design 4 All approach.

∞ Need of the academic community of the University to address the cultural change inherent in the use of new technologies of social networking. Forums, wikis, facebook, delivery of e-books could be incorporated to the integrated system and offer new possibilities in the framework of a blended learning approach e.g. the participation in collaborative schemes. The classroom of the future will be based on the operation of Integrated Systems (IS) with a single logon, which includes components that all are interrelated and interconnected. Main components of the IS will support all the forms of learning: classroom and online courses, ubiquitous learning environments based on ubiquitous technologies, m-Learning, blended-learning, before, during, and after the lesson. Content handling will be done online, and in real time. Other important components will be included in the IS: 1) for supporting the collaborative development of learning content, 2) to offer/gain access to multimedia information, 3) to personalize and adopt content according to the needs, and 4) to use Social media for informal learning, communication, encouragement of participation, etc. The IS will offer the possibility of various types of operation: student-centered, lecturer-centered, administrator-centered, and readers' view. A prerequisite for the effective use of the IS will be the generalized support of mobile devices, as well as interactive whiteboards and telepresence boards. The main functional components of the integrated system are the following:

∞ Online real time component for supporting various types of teaching and learning: e-learning, m-learning, distance learning, blended learning, lessons in the mainstream class and in parallel classes

∞ Personalization of learning and adoption according to the needs e.g. support of the design-4-all principles

∞ Multimedia, collaborative learning content creation and delivery

∞ Content quality control e.g. approval of new entries, handling of the material according to the preferences of students Collaborative wikis and multimedia, collaborative dictionaries of terminology dynamically related and linked to the learning content Social networking for the encouragement and support of the inclusion

- ∞ Events based dissemination of information related to the academic life
- ∞ Training of students, lecturers, technical and administrative staff
- ∞ Help desk
- ∞ Resources planning and allocation
- ∞ Volunteers' database for supporting teaching and learning. Volunteers could be Note takers, Sign Language interpreters, readers for blind students, etc.

UBIQUITOUS Computing Application Areas

Ubiquitous computing aims to permeate and interconnect all areas of life, and thus to enable a ubiquitous flow of data, information, and – by integrating cognitive capabilities in the future – even knowledge. Mark Weiser, one of the fathers of ubiquitous computing, described this vision of a continual and ubiquitous exchange transcending the borders of applications, media, and countries as “everything, always, everywhere.” This sketch offers a strongly future-oriented perspective on ubiquitous computing that is still far removed from today's reality. Although wireless Internet access, email via mobile phone, handheld computers and the like may give the impression that constant, unimpeded exchange of information is already routine, in the future the special performance characteristics of ubiquitous computing will enable an entirely new quality in the exchange and processing of data, information and knowledge. With ubiquitous computing, many of these processes will recede into the background, and most will occur partially or wholly automatically. But this new form of ubiquitous computing will not develop uniformly and synchronously in all economic and social areas. Rather, applications will be defined and implemented at different speeds in different contexts. Nine application areas in which ubiquitous computing is already recognizable and is very likely to play a decisive role in the future are mentioned below.

Communications: as a cross-application, the communications area affects all forms of exchange and transmission of data, information, and knowledge. Communications thus represents a precondition for all information technology domains.

Logistics: tracking logistical goods along the entire transport chain of raw materials, semi-finished articles, and finished products (including their eventual disposal) closes the gap in IT control systems between the physical flow and the information flow. This offers opportunities for optimizing and automating logistics that are already apparent today.

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Motor traffic: automobiles already contain several assistance systems that support the driver invisibly. Networking vehicles with each other and with surrounding telematics systems is anticipated for the future.

Military: the military sector requires the provision of information on averting and fighting external threats that is as close-meshed, multi-dimensional, and interrelated as possible. This comprises the collection and processing of information. It also includes the development of new weapons systems.

Production: in the smart factory, the flow and processing of components within manufacturing are controlled by the components and by the processing and transport stations themselves. Ubiquitous computing will facilitate a decentralized production system that will independently configure, control and monitor itself.

Smart homes: in smart homes, a large number of home technology devices such as heating, lighting, and ventilation and communication equipment become smart objects that automatically adjust to the needs of the residents.

E-commerce: the smart objects of ubiquitous computing allow for new business models with a variety of digital services to be implemented. These include location-based services, a shift from selling products to renting them, and software agents that will instruct components in ubiquitous computing to initiate and carry out services and business transactions independently.

Inner security: identification systems, such as electronic passport and the already abundant smart cards, are applications of ubiquitous computing in inner security. In the future, monitoring systems will become increasingly important – for instance, in protecting the environment or surveillance of key infrastructure such as airports and the power grid.

Medical technology: Increasingly autarkic, multifunctional, miniaturized and networked medical applications in ubiquitous computing offer a wide range of possibilities for monitoring the health of the ill and the elderly in their own homes, as well as for intelligent implants.

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Comparison and Analysis of the Path Loss Models Used In E BAND Communication System for Mobile Wimax Topology

HOD Deepti rai*

Jayshree sisodiya**

Abstract

Fifth - generation cellular systems are likely to operate in or near the millimeter-wave (mm Wave) frequency bands of 30–300 GHz, where vast spectrum currently exists with light use. At these mm Wave frequencies, the wavelength is so small that highly directional, steerable antennas may be used in novel ways.

This research work presents empirically-based large scale propagation path loss models for fifth generation cellular network planning in the millimeter-wave spectrum based on real-world data at 28 GHz and 38 GHz. The model in this paper allows future realistic modeling of propagation conditions for millimeter wave transmission in urban microcellular environments. This model also suggests that in future millimeter wave communications, mobile devices shall deploy antennas with higher gains to compensate for the additional path loss due to the frequency leap from low microwave to the millimeter wave regime.

Keywords: loss models, SUI, ITU-R, mm wave communication, 5G system.

I. Introduction

Despite millimeter wave (mm Wave) technology has been known for many decades, the mm Wave systems have mainly been deployed for military applications. With the advances of process technologies and low –cost integration solutions, mm wave technology has started to gain a great deal of momentum from academia, industry, and standardization body. In a very broad term, mm Wave can be classified as electromagnetic spectrum that spans between 30 GHz to 300 GHz, which corresponds to wavelengths from 10 mm to 1 mm [1]. In this paper, however, we will focus specifically on 60 GHz radio (unless otherwise specified, the terms 60 GHz and mm Wave can be used interchangeably), which has emerged as one of the most promising candidates for multigigabit wireless indoor communication systems [2]. 60 GHz technology offers various advantages over current or existing communications systems [3]. One of the deciding factors that makes 60 GHz technology gaining significant interest recently is due to the huge unlicensed bandwidth (up to 7 GHz) available worldwide. While this is comparable to the unlicensed bandwidth allocated for ultra wideband (UWB) purposes [4], 60 GHz bandwidth is continuous and less restricted in terms of power limits. This is due to the fact that UWB system is an overlay system and thus subject to very strict and different regulations [5]. The large bandwidth at 60 GHz band is one of the largest unlicensed bandwidths being allocated in history. This huge bandwidth represents high potentials in terms of capacity and flexibility that makes 60 GHz technology particularly attractive for gigabit wireless applications. Furthermore, 60 GHz regulation allows much higher transmit

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power compared to other existing wireless local area networks (WLANs) and wireless personal area networks (WPANs) systems.

The higher transmit power is necessary to overcome the higher path loss at 60 GHz. While the high path loss seems to be disadvantage at 60 GHz, it however confines the 60 GHz operation to within a room in an indoor environment. Hence, the effective interference levels for 60 GHz are less severe than those systems located in the congested 2–2.5 GHz and 5–5.8 GHz regions. In addition, higher frequency reuse can also be achieved per indoor environment thus allowing a very high throughput network. The compact size of the 60 GHz radio also permits multiple antennas solutions at the user terminal that are otherwise difficult, if not impossible, at lower frequencies. Comparing to 5 GHz system, the form factor of mmWave systems is approximately 140 times smaller and can be conveniently integrated into consumer electronic products.

II. SUI Path-Loss Model

The SUI model covers three terrain categories common around the United States. Category A represents the maximum path-loss category which is a hilly terrain,

Table 1: SUI Model Parameters

Model Parameters	Terrain Type A	Terrain Type B	Terrain Type C
a	4.6	4	3.6
b	0.0075	0.0065	0.005
c	12.6	17.1	20

Category B represents an intermediate path-loss category, and Category C represents the minimum path-loss category with mostly flat terrains. The empirical formulas for this model were obtained based on experiments done in the United States [6].

The median path-loss for the SUI model can be generally written as

$$L = A + 10\gamma \log(d/d_o), \tag{1}$$

for $d > d_o$, where $d_o = 100m$. The term A in the above equation is given by $A = 20 \log(4\pi d_o / \lambda)$, where λ is the wavelength in m. The path-loss exponent γ is given by

$$\gamma = a - bh_t + c/h_t$$

(2) in which the parameters a, b and c depend on the terrain category and are defined in the table below. These parameters are obtained at 2GHz frequency and receive antenna height of 2m. In order to use the model for other frequency and receive antenna heights, the following correction terms can be used.

$$L = L + \Delta L_f + \Delta L_h$$

where

$$\Delta L_f = 6 \log(f / 2000)$$

and the receive antenna height correction term is given by

$$\Delta L_h = \begin{cases} -10.8 \log(h_r / 2), & \text{Categories A, B} \\ -20 \log(h_r / 2), & \text{Category C} \end{cases}$$

where h_r is the receive antenna height.

III COST-231 Hata-Okumura Model

An extension to the Hata model described above is the COST-231 Hata model [1]. This model is designed to be used in the frequency band from 500 MHz to 2000MHz. As the Hata Model, the COST-231 is restricted to cell radius greater than 1 km and may not be suitable for cells on the order of 1km radius.

$$PL_{COST-231} = 46.3 + 33.9 \log_{10}(f_c) - 13.82 \log_{10}(h_b) - a(h_m) + 44(9 - 55.6 \log_{10}(h_b)) \log_{10} R + c_m$$

For a large city the correction factor $a(h_m)$ is used below.

$$a(h_m) = 2.3 (\log_{10} 1175 \cdot h_m)^2 - 97.4 \quad f_c > 400\text{MHz}$$

For suburban or rural areas the correction factor $a(h_m)$ is used in the equation below.

$$a(h_m) = 1.1 (\log_{10} f_c - 7.0) h_m - 56.1 (\log_{10} f_c - 7.0)$$

As noted the $a(h_m)$ correction factors are the same for both the original Hata model as well as the COST-231.

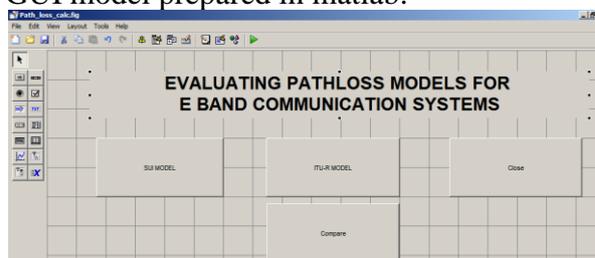
IV Results

In this particular work we have prepared a matlab graphical user interface which would allow us to evaluate the 5g communication system in more detail as well as under various scenarios such as

1. Terrain type
2. Size of antenna
1. Distance between nodes

The prepared GUI allows us to dynamically change the pattern and parameters for 5G communication systems and thus will allow us to evaluate the two models in more detail.

GUI model prepared in matlab:-



The above graphical user interface gets the data from the user and then plots the path loss for that particular models. The results can be summarized in tabular form as below:-

Table 2:- comparison of SUI and ITU-R model

Frequency	MS Antenna Height	BS Antenna height	Distance	Topography	Path loss in SUI	Path loss in ITU-R
2 GHz	1m	30m	10km	Small to medium	92.2dB	71.3 dB
2 GHz	1m	30m	10km	Large city	93.04dB	75.12 dB
2 GHz	1m	30m	10km	Sub urban area	84.24dB	71.3 dB
2 GHz	1m	30m	10km	Open rural area	56.4dB	-----

Thus based on above results it can be seen that ITU-R model offers lower path loss at the above parameters.

IV. Conclusion

The E-band has opened up new potentials and challenges for providing affordable and reliable Gigabit per second wireless point-to-point links.

The popularity of multimedia applications and broadband internet has created an ever increasing demand for achieving higher throughputs in cellular and wireless networks. Due to the higher carrier frequencies; the antennas are more directional, making E-band systems mainly suitable for line-of-sight (LOS) applications.

Rain and obstacles more severely attenuate radio signals in the E-band. Consequently, with the same transmit power and link availability requirements, E-band wireless links can operate over shorter distances when compared to microwave systems. The model in this paper allows future realistic modeling of propagation conditions for millimeter wave transmission in urban microcellular environments. This model also suggests that in future millimeter wave communications, mobile devices shall deploy antennas with higher gains to compensate for the additional path loss due to the frequency leap from low microwave to the millimeter wave regime.

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A Study on Problems Faced By Workers in Cashewnut Units in Kurinjipadi Block of Cuddalore District

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Dr. T. SEZHIYAN**

Abstract

Present India is the largest (3rd place) producer and processor of cashews in the world. The export value of cashew nut in during the year (2016-17), 96346 million tonnes. Cuddalore district is one of the large cashew nut unit located region in Tamil Nadu. The cashew industries create a livelihood for about 1.75 lakhs of employees and farmers in Tamil Nadu. The Cuddalore district alone more than 40,000 employees directly involved in the industry. The women workers are played a vital role in these industries. It is a fact that cashew industry utilizing by the women worker directly and giving important for employment opportunities to women in this sector. At the same time, the workers are faced several problems like physically and mentally in this industries. But the government and owners are not taking any proper action in these issues. The cashew nut processing industries one of the prominent sector producing valuable food commodity to exported Gulf Countries, European and Western countries. This paper deals with labours problems faced by the cashew nut industries in Kurinjipadi block of Cuddalore district.

Keywords: Livelihood, Processing, Valuable Food Commodity.

Introduction

Cashew (*Anacardium Occidentale*), often referred to as 'wonder nut', is one of the most valuable processed nuts traded in the global commodity markets and is also an important cash crop. It has the potential to provide a source of livelihood for the cashew growers and rural peoples, empowering rural women, create employment opportunities and generate foreign exchange through exports. The cashew tree is believed to be a native of Brazil, from where it has dispersed to different parts of the world primarily for soil conservation, forestation, and wasteland development. The term 'Cashew' has originated from the Brazilian name 'acajaiba' and the Tupi name 'acaju', which the Portuguese converted into 'caju' and is commonly known as 'kaju' in India. It is known as 'Paragi Andi' in Kerala meaning foreign nut, 'Lanka Beeja' in Orissa assuming its introduction from Sri Lanka, and 'Mundiri' indicating the shape of the nut in Tamil Nadu.

Review of Literature

Atul methodet. al (2011) in their study entitled "cashew nut processing: sources of environmental pollution and standards" India is the largest producer, processor, exporter and second largest consumer of cashew in the world with annual production of 6,20,000 MT (Anon 2007). India processed about 1.18 million MT of raw cashew seeds through 3650 cashew processing industries scattered in many states of the country provided employment to over 0.5 million people, 95% of these are women (Nair, 1995). The cashew industries in India employed different unit operations/ methodology for processing depend

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on a variety of raw material, location, technological mechanization and availability of secured energy supply. There are two commonly followed methods of cashew nut processing, viz. Roasting process and steam (roasting) cooking process. Due to lack of skilled man power for the cutting process of cooked nut and difference in the taste of nut, many of the industries in India are following the roasting process. In the cashew nut roasting process, thick black smoke is released from the rotating roasting drum through the stack. The smoke, when it reaches the ground, has irritating order and is a public nuisance in the neighborhood. Borma heater is also a source of air pollution. Wastewater is generated from the quenching operation of the roasted cashew nut discharged. Cooking process also discharges wastewater from the steam cooker and emits air pollutants by baby boiler for steam generation and Borma heater. The sources of different pollution and Hazards have been discussed in this article.

S. K. Nag et. al (2014) in his article “effect of entrepreneurship development through cashew processing on the socio-economic status of villagers, improvement of livelihood security through the sustainable integrated farming system”. In his article analyzed the main problems of cashew nut industries workers and major hazards. The main problem faced by the workers is how to use or women in the roasting process, steam cooking process and Borma over section. He analyzed the training and method given by the owners of these industries is also discussed in this article. The main aim of this paper is discussed the main problem regarding roasting, steaming and cooking process and Borma over section.

Statement of the Problem

Basically, cashew nut industries faced three types of problems (i.e.) 1. Availabilities of raw cashew nut from farmer's side, 2. Processing industry has some problems within the factory in production level, 3. The workers facing problems with the cashew industries.

The cashew plantain generally planted in waste land for purpose of soil erosion, aforestation, and increasing rural employment opportunities. For the natural clematis like storm, cyclone, heavy rain and monsoon failure, the cashew farmers faced several problems. The cashew nut processing industry faced labour problem, investment problem, availability of cashew problem and so on. The labours faced several problems such as mechanical hazard, physical hazards, chemical hazards, environmental hazards, and very particularly psychological hazards. In Cuddalore district, cashew nut processing industry falls under the small-scale industry. The nature of small and cottages industry is well known the conditions and problems. In this study, the research issues are (i) What are the problems faced the cashew industries owners, (ii) What are the problems faced by the labours in working place and (iii) What is the problem faced by the cashew farmers in the Cuddalore district. Base the research issues the researcher take only, the labour problem faced by the workers in the cashew industries.

The labours mainly faced problems like first aid, restroom, toilet facilities, hospital expenses and etc. The researcher analyzed only the basic problem faced by the workers in the study area in Kurinjipadi block of Cuddalore district.

Methodology

The present study is based on the primary data and it will be collected from the selected villages namely Puliyure and Samattikuppam in Kurinjipadi block of Cuddalore district. The primary data will be collected using though structured interview schedule. The simple random sampling method was adopted and totally 120 respondents were selected from the

two villages. The simple percentage analyses were employed in this study. The 60 sample from each village were selected randomly. The period of the study is one year (ie) May 2017 to April 2018.

Objectives

1. To analyze the problems faced by the cashew workers in Kurinjipadi block.
2. To identify the occupational hazards faced by the cashew industry workers in Kurinjipadi block

Limitation

The workers of cashew units from selected villages only taken into account, noother industry are included in their study.

The problems faced by the workers in these industries are only taken for the analysis.

Result and Discussion

Based on the selection of village and sample respondents the analyses were made. The objectives based analysis reflects the result in this part as below.

Table-1: Classification of the respondents according to the selection of villages in the study area

S.No	Kurinjipadi Block	No of Respondents	Percentage
1.	Puliyure	60	50.0
2.	Samattikuppam	60	50.0
Total		120	100.0

Source: Computed

Table-1 discusses the selection of villages and respondents in the study area of Kurinjipadi block in Cuddalore district. More than 6 blocks farmer's cultivator cashew nut among the 13 blocks in Cuddalore district. The 4 blocks were cultivator cashew in large areas, namely Panruti, Annagaramam, Cuddalore, and Kurinjipadi. Among the four blocks, the researcher selected only Kurinjipadi block.

The researcher selected 60 respondents in each village and in total 120 respondents from two villages in Kurinjipadi blocks, namely Puliyure and Samattikuppam. The selection of village made by running of the cashew units in the villages. Respondents were selected based the dependents on the cashew units running the study area.

Table-2: Social Status Classification of the Respondents in the Study Area

Sl.No	Category	No of Respondents	Percentage
	Age		
1.	Below-25 years	21	17.5
2.	26-35 years	42	35.0
3.	36-45 years	34	28.3
4.	Above-45 years	23	19.2
Total		120	100.0
Gender			
1.	Male	21	17.5
2.	Female	99	82.5
Total		120	100.0
Community			
1.	OC	13	10.8

2.	BC	48	40.0
3.	MBC	52	43.3
4.	SC/ST	7	5.8
	Total	120	100.0
	Educational qualification		
1.	Illiterate	32	26.6
2.	Primary Education	51	42.5
3.	Secondary Education	23	19.2
4.	Diploma and ITI	6	5.0
5.	Under Graduation	5	4.2
6.	Post Graduation	3	2.5
	Total	120	100.0
	Occupation		
1.	Agriculturist	50	41.6
2.	Non -Agri labour	47	39.1
3.	Daily Wages	19	15.8
4.	Private employee	3	2.5
	Total	120	100.0

Source: Computed

Table-2 discusses the respondent's social status in the study villages. The table highlights the general categories of age, gender, community, educational qualification, and occupation of the respondents. Regarding age, the researcher grouped 4 categories, according to the respondent's age. Of the surveyed sample 35 percent in records as the age group of 26 to 35 years, in the age group of 36 to 45, 28.3 percent is recorded and above 45 years of age group were 19.2 percent are recorded. The remaining 17.5 percent of the respondents fall under below 25 years of age group. From the table, it is revealed that, the age group of 26-35 years workers is recorded as the highest percentage in the study villages.

Regarding gender, category 82.5 percent of the respondents are registered under the female categories the remaining 17.5 percent is registered under the male categories. Of the total sample survey, the cashew industry gives the preference to the male categories for their all work. The male respondents are employed only for supervising, loading unloading, and boiling section.

Recording to community category the researcher grouped 4 categories, such as OC, BC, MBC, SC/ST as such, in the 4 categories, Most Backward Class (MBC) and Backward Class (BC), are regarded high level of employment in the cashew units of all the villages in Kurinjipadi block of Cuddalore district. The 43.3 percent of the respondents are registered Most Backward Class (MBC) and 40 percent are registered Backward Class (BC) in the cashew unit of the study area. The reason behind a large number of workers among the two categories of the study area is more than 65 percent of respondents belong to this two type of categories. Among the cashew units in the region more than 60 percent of micro-units run by MBC and BC community in the study region. Therefore these two categories of respondents played a vital role in the study region.

Regarding the educational qualification of the respondents in the study, region is classified into six categories. Of the total respondents, 42.5 percent are register under the category of primary education and 26.6 percent of the respondents are registered in the category of illiterate. The 19.2 percent of the respondents were registered under the secondary education category. The 5 percent, 4.2 percent and 2.5 percent of respondents are registered under the Diploma/ITI, UG and PG category of education respectively in the study region. Of the total sample, respondents 89 percent of the respondents are recorded as bellow secondary level of education category. From this table, it is observed that the education level is a lower level in the study region. Only 11 percent of the respondents are having diploma and degree level of education in the study area.

From table 4, the occupational respondents are analyzed and categorized by 4 groups according to their nature of employment. Of the total surveyed sample 41.6 percent are recorded as an agriculturist category, the 39.1 percent of the respondents are registered under the category of non-agriculture labor in the study region. The 15.8 percent of the respondents are registered the daily wages category and 2.5 percent of the respondents are registered under private employ category in the study region of the Cuddalore district.

From the table, it is clearly identified that 80.7 percent of the respondents are fallen under the agriculturist and non-agriculture labour categories. Because of the study region mostly covered agriculture and allied activities. Hence, most of the respondents are belongs to the agriculturist and non-agriculturist categories.

Table-3: Analyzing the Respondents According to their FamilyStatus in the Study Region

S.No	Marital Status	No of Respondents	Percentage
1.	Married	93	77.5
2.	Unmarried	23	19.2
3.	Widow	4	3.3
	Total	120	100.0
	Size of family		
1.	Small	70	58.3
2.	Medium	36	30.0
3.	Large	14	11.7
	Total	120	100.0
	Type of family		
1.	Nuclear	80	66.7
2.	Joint	40	33.3
	Total	120	100.0

Source: Computed

Table-3 explains the respondent family status of the study region in Kurinjipadi block of Cuddalore district. The researcher is classified the respondents family status namely marital status, family size and family type in the study region. Regarding the respondents marital status, it again grouped into three categories namely as married, unmarried and widow/separator. Of the total surveyed sample size, 77.5 percent of the respondent is registered under the category of the married category, 19.2 percent of the respondents are

register in the unmarried category and only 3.3 percent of the respondents are recorded as widow/ separator category in the study are region.

Regarding the family size of the respondents 58.3 percent belongs to the small family, 30 percent belongs to the medium family and 11.7 percent of the respondents are belongs to the large family size in the study area. Regarding the type of family, 66.7 percent of the respondents belong to the nuclear family and 33.3 percent of the respondents are belongs to the joint family system in the study area.

In the study region, most of the people want to live individually. Therefore, in the study region, the nuclear family systems are higher.

Table-4: Classification of the Respondents under the Division of Work in Cashew Unit

S.No	Division of work	No of respondents	Percentage
1.	Cutting, Shelling and Peeling	60	50.0
2.	Steaming, Grading and Drying	37	30.8
3.	Roasting and Packing	16	13.3
4.	Supervising	2	1.7
5.	Loading and Unloading	4	3.3
6.	Office work	1	0.8
	Total	120	100.0

Source: Computed

Table-4 discuss the nature of work rendered by the respondents and division which they work in cashew unit in the study region. The researcher identified the various types of process undergone in the cashew unit and all industrialist followed similar types of the section in the cashew industry in the study region. The researcher classified all the division in to six groups, such as (i) Cutting, shelling and peeling groups, (ii) Steaming, grading and drying another category (iii) Roasting and packing on another division, (iv) Loading and unloading on other division, (v) Supervising, and (vi) other office work. The 50 percent of the respondents are recorded in the first division of work in the cashew unit, 30.8 percent of the respondents are recorded as second division of cashew unit such as steaming, grading and drying, 13.3 percent of the respondents are recorded the third group off in the cashew unit such as roasting and backing, 1.7 percent of the respondents are recorded fourth division of supervising. 3.3 percent of the respondents are recorded as loading, unloading, and cleaning work division in the cashew unit. Only 0.8 percent of the respondents have recorded the office work division of the cashew unit. Form the table it is clearly identified that 50 percent of the respondents are engaged in the cutting, shelling and peeling division of work in the cashew industry in the study region. Remaining 50 percent of the respondents are engaged in other category division of work in the cashew industry the study region.

Table-5: Classification of the Respondents Faced by the Occupational Hazards and Problems

S.No	Occupational Hazards and Problems	No of Respondents	Percentage
1.	Mechanical Hazards		
	Back pain problem	26	21.7
	Cut and wounds	12	10.0
	Minor accidents	8	6.7
	Total	46	38.4
2.	Environmental Hazards		
	Skin diseases	19	15.8
	Asthma problems	14	11.7
	Respiratory problems	11	9.2
	Total	44	36.7
3.	Chemical Hazards		
	Shell oil fire accident	4	3.3
	Eyes affect	3	2.5
	Total	7	5.8
4.	Physical Hazards		
	Menstrual problems	10	8.3
	Hemorrhoids	3	2.5
	Miscarriage	2	1.7
	Total	15	12.5
5.	Psychological Hazards		
	Long working hours	5	4.2
	Mental stress	3	2.5
	Total	8	6.7
	Grand Total	120	100.0

Source: Computed

Table-5 discusses the occupational hazards and problems faced by the respondents in the cashew units of the study region. The hazards are classified as five categories such as mechanical hazards, environmental hazards, chemical hazards, physical hazards, and psychological hazards as such cashew units. The cashew unit's workers faced the above-said hazards frequently in the study region. 38.4 percent of the respondents are recorded as facing by the mechanical hazards in the cashew units, 36.7 percent of the respondents faced environmental hazards, 12.5 percent of the respondents are recorded as physical hazards problems. The 5.8 percent and 6.7 percent of the respondents are faced with chemical hazards and psychological hazards in the cashew industry respectively.

All the workers in the cashew industry of the study region they faced the occupational hazards each and every day in the study region. At the same time, the respondents are doing bother about the hazards faced in the cashew industry.

The people works of the cashew industry in the study region are very careless/awareness about the occupational hazards. They are taking very simple issues and continue to then work in the cashew units. Therefore the reason it's aware of the fetcher life and the problems created by the occupational hazards in the study region.

Table-6: Classification of the Respondents by Taking Treatment for their Health Problems

S.No	A place for taking treatment	No of Respondents	Percentage
1.	Primary Health Centre	32	26.7
2.	Government Hospital	84	70.0
3.	Private Hospital	4	3.3
	Total	120	100.0

Source: Computed

Table 6 highlights the place for taking treatment of their health problem faced by the hazards in the cashew units. The cashew industry workers have undergone the treatment through various type of health center of their health problems. The researcher identified that and places of treatment undergone by the respondents and classified three categories as (i) primary health center,(ii)government hospital and (iii) private hospital.

The 70 percent of the respondents are recorded to take the treatment for the health problem by the occupational hazards in the government hospital in the study region. The 26.7 percent of the respondents are undergone the treatment of their health problems from the primary health center in the rural areas of the study region. And only 3.3 percent of the respondents are gone through private hospitals for their health problem in and around the study region.

From the table, it is identified nearly 70 percent of the respondents is undergone the treatment for their health problem for the government hospital.

Table-7: Classification of the Respondents by their Treatment Expenditure Per Annum

S.No	Treatment Expenditure	No of Respondents	Percentage
1.	Below Rs.20000	60	50.0
2.	Rs 20001 to Rs 30000	40	33.3
3.	Rs 30001 to Rs 40000	14	11.7
4.	Above Rs 40000	6	5.0
	Total	120	100.0

Source: Computed

Table-7 brings out the treatment expenditure level of the respondents for their health problem in the study region. The researcher classified the treatment expenditure of the respondents into four categories namely, (i) Below- Rs.20,000 (ii) Rs.20,001- Rs. 30,000. (iii) Rs.30,001- Rs.40,000 and above Rs.40,000.in the study region.

The 50 percent of the respondents are recorded as the treatment expenditure of below-Rs.20,000 per annum, 33.3 percent of the respondents have recorded their treatment expenditure of Rs.20,001- Rs.30,000 in the study region. The 11.7 percent and 5.0 percent of the respondents were recorded of their treatment expenditure of Rs.30,001- Rs.40,000 and above Rs.40,000 per annum respectively.

From the table.7, it is revealed thatnearly 50 percent of the respondents is recorded below Rs.20,000 of their treatment expenditure per annum. Only 5 percent of the respondents has recorded the highest treatment expenditure level of above Rs.40,000 per annum in the study area.

Table-8: Classification of the Respondents about Treatment Expenditure Compensation given by the Cashew Unit in the Study Area

S. No	Category	No of Respondents		Total
		Yes	No	
1.	One part (25 per cent)	11 (9.2)	0 (0.0)	11 (9.2)
2.	Some Amount (20 per cent)	14 (11.7)	0 (0.0)	14 (11.7)
3.	No Compensation (0 per cent)	0 (0.0)	95 (79.2)	95 (79.2)
	Total	25 (21.3)	95 (78.7)	120 (100.0)

Source: Computed

Table.8 brings out treatment expenditure and compensation given by the cashew units to the respondents in the study region. The researcher identified treatment expenditure and compensation is given by the cashew units in the study area and their compensation are classified into three categories. The one part (25 percent), some amount (below-20 percent) of the total treatment expenditure and no compensation given by the owner of cashew industries in the study region. The workplace accident is unavailable and some type of hazards namely environment, chemical, psychological hazards are also unavoidable. Hence the medical expenses incurred to the respondents and workers in the cashew industries are common issues in the study area.

From the above table, it is clearly identified the compensation given by the cashew units are examined 79.2 percent of the respondents are opined the cashew unit management will not give any type of compensation for their occupational hazards medical expenses in the study region. On the other hand, 11.7 percent of the respondent's give theirs varies the management of cashew units give some amount (below-20 percent) of the total medical expenditure to the respondents in the study area of Cuddalore district. The 9.2 percent of the respondents opined that one part (25 percent) of the total medical treatment expenditure of the respondents in the study area.

From the table, it is clearly understood that more than 79.2 percent of the respondents view the cashew industries management/owner are should not give any compensation of the accident, illness and health problems caused by the cashew industry to the workers in the entire study area of Cuddalore district.

Findings

1. The 63.3 percent of the respondents are fallen under the age group of 26-45 years
2. The 82.5 percent of the respondent belongs to the female workers and 17.5 percent of respondents are male workers in the study area.
3. Mostly 42.5 percent of the respondents are recorded as primary education level.
4. The 41.6 percent of the respondent occupation is recorded as agriculture-based activities in the study region.
5. The 77.5 percent of the respondents is recorded as married categories in the study region.
6. More than 50 percent of the respondents worked in the division of Cutting, Shelling and Peeling section are recorded in the study region.

7. The 38.4 percent of the respondents are recorded as facing by the mechanical hazards in the cashew units, and 36.7 percent of the respondents faced environmental hazards in the study region.
8. The 70 percent of the respondent's are undergone the treatment for their health problem for the government hospital.
9. Mostly 50 percent of the respondents are recorded as the treatment expenditure of below- Rs.20,000 per annum in the study region.
10. The 79.2 percent of the respondents view the cashew industry management/owner are should not give any compensation of accident, illness and health problems caused by the cashew industry to the workers in the study area.

Suggestion

Based on the analysis and findings of the study, the following suggestions were made.

1. Most of the workers in cashew units are female workers and they come from surrounding villages with a low level of educational background. They are unaware of the hazards. Therefore the management gives the proper training and provides the safeguard equipment to them further safety.
2. The industrial accidents are unavertable. Therefore the management should give compensation and medical expenditure to the workers.
3. The present day health expenditure (or) medical expenditure is very high. Hence. The management or owners of cashew industries rise up their wages/salary to some extent to meet out their expenses.
4. In the study region, some industries not provided the safety equipment to the workers were working in cutting, boiling and cooking section. Therefore the health department should Mumford these industries and maintained the work safety in for the employers.
5. The management of cashew nut industries should come forward to provide the minimum or basic activities to the employers in the industrial premises.

Conclusion

In general, it is found that there is unanimity as regard to origin and history of cashew plant. It is one of the oldest fruits used from 500 years in India. Cashew has a wide range of its importance. Being tropical fruit, cashew was introduced in the Malabar Coast considering as a wasteland crop grown for afforestation and soil conservation of the hilly area. At present, it is cultivated along east-west coast and in some interior part of India. However, on the commercial base, it is grown at selected locations all over India. Based on the study, the cashew industries in one of high revenue earned industry in India. Hence, that the industrialist and government should give important and improve the level of the industries, industries workers and farmers. The study on problems faced by workers in cashew nut units in Kurinjipadi block of Cuddalore district brings out the standard of living of cashew industry workers, working condition and Problems faced by the cashew industry workers. The rising cost of living compels the workers to take up the job. Particularly women workers are facing a lot of problems in their working environment. Their socioeconomic conditions will be improved only if adequate measures are taken to overcome their problems. The state and central government can formulate many policies to increase the welfare of the workers. This study helps to suggest increasing the socioeconomic conditions of women workers of cashew industries.

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Comparing Quantum Key Distribution Protocol with Current Cryptographic Schemes

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Abstract: The concept of quantum entanglement has given birth to many new branches of physics, the most interesting being Quantum Cryptography. Quantum cryptography applies the principles of Quantum Mechanics to protect information channels against eavesdroppers even when assuming that they have unlimited computing powers. The well-developed protocol in quantum cryptography is Quantum Key Distribution (QKD) that establishes a shared private key between the sender (Alice) and the receiver (Bob). In this contribution, we illustrate richly the role played by quantum entanglement and quantum information in setting up a 'secure quantum channel' between Alice and Bob. Simple QKD protocols are analyzed and compared with the current cryptographic schemes being used in the industry like Public Key Distribution- Diffie Hellman, RSA, etc. outlining the vulnerabilities of the latter. The future prospects of QKD are presented along with the practical challenges.

1. Introduction

Everybody has their secrets. No one wants to have a third person sneaking up their private information. Cryptography is the science of establishing secure communication using physical or mathematical techniques. While cryptologists develop newer methods to conceal confidential information, cryptanalysts devise powerful techniques to break the same. This cat and mouse race has driven a tremendous progress of the field attracting widespread participation from large groups of physicists, mathematicians and engineers around the globe.

The first major blow to the classical cryptographic schemes was when Peter W. Shor [1] demonstrated that Shor's algorithm, a quantum algorithm for factoring integers exponentially faster than the currently best known classical algorithm. This uncovered the critical security threat that quantum computation posed on all cryptographic schemes which are based on the limitations of classical computational ability.

Therefore the need of the hour is to develop a cryptographic skeleton that relies purely on the laws of physics rather than classical edge of computers. This is what Quantum Cryptography promises.

2. Classical Cryptographic Schemes

Let us introduce the main characters – Alice wants to send a private message to her friend Bob, and protect it from a very nosy eavesdropper Eve. Classically there two available schemes:

(a) Private Key Distribution

This is the earliest form of the encryption method, a traditional example being Caesar cipher. It is believed that Julius Caesar used a simple letter substitution method for private correspondence. Each letter in Caesar's message was replaced by the letter 3 places ahead alphabetically. The number of shifts (3 in this case) is the key of the cryptosystem and must be kept a secret.

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The private key is a string of random bits known only to Alice and Bob. The information is encoded in a correlation between the transmitted string and the key. The security of this scheme lies in the fact that the transmitted data contains no information- even if Eve intercepts the transmission she will not learn anything about the information.

But there's a problem: the key is based upon some logic, and logics can be decoded if the eavesdropper is very smart. In classical world, Eve can monitor the channel without being detected by Alice and Bob, as her act of snooping would not in any way leave a mark upon the information. Hence, the channel can never be perfectly secure.

(b) Public Key Distribution:

In 1976, W. Diffie and M. Hellman discovered a different type of cryptosystem, where the problem of establishing a secure channel was solved. The method relies on the limitation of computational abilities, for example, calculation discrete logarithm problem and the factorization of large integers, of the classical computers.

The most famous and commercially used public cryptosystem is RSA- named after the inventors Ron Rivest, Adi Shamir and Leonard Adleman [2]. It is based on the postulate that in order to factorize a big natural number with N digits any classical computer needs at least a number of steps that grows faster than any polynomial in N.

RSA is an asymmetric algorithm; it requires two different keys per user to be able to communicate. One of the keys is the *public key* that is to be distributed publicly, and the other key is the *private key*, that is to be kept private.

Illustration

1. Choose two prime numbers: $p=3, q=11$
2. Compute the product: $n=p*q=33$
3. Find the function: $\phi(n)=(p-1)*(q-1)=20$
4. Choose any number such that $\gcd(e, \phi(n))=1$; let, $e=7$
5. Choose d such that $(d*e)\text{mod}(\phi) = 1$
 $(d*7)\text{mod}(20)=1$, one possibility is $d=3$
Public key: (e,n)
Private key: (d,n)
6. Let the ASCII code of the message to be sent is $P=2$
7. Cipher text $C=(P^e)\text{mod}(n)$; $C=(2^7)\text{mod}(33)=29$ is sent by Alice over a Public Channel
8. Bob receives the cipher text C and, retrieves the plain text P by $P=(C^d)\text{mod}(n)$;
 $P=(29^3)\text{mod}(33)=2$

Hence the protocol is successful!

For Eve to compute Bob's private key, she has to carry out the calculation: $d*e=1(\text{mod}(\phi(n)))$. The problem she will face here is to compute $\phi(n)$. For that, she needs to calculate the factors: p and q. For classical computers, finding the factors to large numbers becomes exponentially harder as the number of digits increase. For practical applications, p and q are chosen to be very large (~400), so as to factorize them, a classical computer would require time, even greater than the age of the universe itself [3]!

But there's a catch: RSA in the current scenario is safe as long as a scalable *quantum computer* remains unfeasible. A universal quantum computer would facilitate solving many mathematical problems in a more efficient way with respect to their classical counterparts- in particular the integer factorization, as was demonstrated by Shor's Algorithm [1]. Therefore, any security protocol that derives from the mathematical complexities of the certain problems is vulnerable to attacks by Quantum Computers.

3. Quantum Key Distribution

In view of the failure of the classical cryptographic schemes to guarantee unconditional security, we look upon to quantum mechanics to rescue. And sure it helps.

The idea of applying the principles of quantum mechanics for the purpose of key distribution was first proposed by S. Weisner and C. H. Bennett and G. Brassard [4]. In 1991, Arthur Ekert [5] proposed to use the consequences of *Quantum Entanglement* and *Bell's Inequalities* in QKD.

The conceptual foundation behind the working of QKD was laid down by a thought experiment performed by Einstein, Podolsky and Rosen[6] in 1935. Named the EPR paradox, it was conceived to erase the status of quantum mechanics as a *complete physical theory*, but quite quickly it became an illustration of how quantum mechanics escapes normal intuition. The normal intuition of a human brain derives its sanity from two basic observations:

(a) Locality – the objects that are separated in space-time cannot exert direct influence on one another, the results of the measurement made on object 1 cannot in any way influence the properties of object 2. We refer to such phenomenon as *local* in nature.

(b) Realism- there exists a reality which is independent of the way the object is observed, that is, the properties of the objects are unaffected by different measurements made on them. Such a phenomenon is referred to as being *real*.

These two basic principles that are taken for granted by our human brain were put to test by John Bell in 1981. He took a maximally entangled state of two qubits. In first state, qubit A is the spin down state while qubit B is in the spin-up state. In second state, qubit A is in the spin-up state while qubit B is in the spin-down state. The maximally entangled singlet state is the superposition of both these states with a negative phase difference.

$$|\psi^-\rangle_{AB} = \frac{1}{\sqrt{2}} (|01\rangle_{AB} - |10\rangle_{AB}) \quad (1)$$

Let's say Alice has access to qubit A, but not B. Similarly Bob has access to qubit B and not A.

This state has the property [3], (with σ being the Pauli spin matrices)

$$\vec{\sigma}^{(A)} |\psi^-\rangle = -\vec{\sigma}^{(B)} |\psi^-\rangle \quad (2)$$

When we consider the expectation value of the measurement of spin of qubit A along an axis n and spin of qubit B along another axis m, where θ being the angle between n and m,

$$\begin{aligned} \langle \psi^- | (\vec{\sigma}^{(A)} \cdot \hat{n}) (\vec{\sigma}^{(B)} \cdot \hat{m}) | \psi^- \rangle &= \langle \psi^- | (\vec{\sigma}^{(A)} \cdot \hat{n}) (-\vec{\sigma}^{(A)} \cdot \hat{m}) | \psi^- \rangle \quad (3) \\ &= -\langle \psi^- | \sigma_i^{(A)} \sigma_j^{(A)} n_i m_j | \psi^- \rangle \\ &= -n_i m_j \delta_{ij} \\ &= -\cos \theta \end{aligned}$$

If \hat{n} and \hat{m} happen to be same ($\theta = 0^\circ$), that is when Alice and Bob are measuring their respective qubits along same direction, then their results are always perfectly anti-correlated. If Alice measures qubit A to be up-spin, then Bob will always measure qubit B to be down-spin and vice versa!

Bell's inequality comes into picture when we consider the locality principle to be true. According to it, the correlations predicted by the quantum theory are incompatible with the locality principle. But recently a loophole-free test of Bell's inequality was reported [7], thereby conclusively verifying the existence of *quantum nonlocality* in nature. We are forced to conclude that Alice's choice of measurement actually exerted a subtle *influence* on the outcome of Bob's measurement. Even when A and B are distantly separated, we

cannot regard them as two separate qubits. They are more than just correlated. They are a single non-separable entity. They are *entangled!*

Ekert protocol [4]

Let us consider a central source producing entangled qubits in the singlet state

$$|\psi^-\rangle_{AB} = \frac{1}{\sqrt{2}} (|01\rangle_{AB} - |10\rangle_{AB})$$

(4)

i.e. we have $|\psi^-\rangle_1, |\psi^-\rangle_2, |\psi^-\rangle_3 \dots$, and distributing qubit A of each state to Alice and qubit B to Bob. For each qubit in their possession, Alice and Bob can measure either σ_1 (spin along X-axis) or σ_3 (spin along Z-axis), their choice of measurement being completely random with a probability of $\frac{1}{2}$ each. There is a $\frac{1}{2}$ chance that Alice and Bob choose a compatible basis (same axis) to measure their qubits. If Alice and Bob chose a compatible basis, and Alice measures a spin up particle, the quantum state of the system collapses into state II (Eq. 4), and the probability of Bob measuring a spin down particle is 100%. Similarly, if Alice observes a particle with spin down, Bob will detect a spin up particle with 100% certainty.

After the measurements are performed, both Alice and Bob announce their observables (not results) over a public channel, for example, if Alice measured her first qubit along σ_1 to be up-spin, she publicly announces “A₁ along σ_1 ”. Similarly, if Bob measured his first qubit along σ_3 to be up-spin, he publicly announces “B₁ along σ_3 ”. Those measurements, for which they chose incompatible basis, are discarded since the results are uncorrelated. For those cases in which they measured along the same axis, their results are perfectly anti-correlated. Hence, they have established a shared random key!

Illustration:

Table 3.1: Correlations between the measurements of Alice’s and Bob’s measurements along compatible basis-establishment of key

Alice’s qubit	Measurement axis	Measurement outcome	Bob’s qubit	Measurement axis	Measurement outcome	Correlation
A1	σ_1	↑	B1	σ_3	↑	⊗
A2	σ_3	↑	B2	σ_3	↓	1 and 0
A3	σ_3	↓	B3	σ_3	↑	0 and 1
A4	σ_1	↓	B5	σ_1	↑	0 and 1
A5	σ_3	↑	B6	σ_1	↑	⊗

Alice’s key – 100

Bob’s key - 011 (each bit is reversed with respect to Alice)

Detection of tampering:

If Eve comes and tries to intercept the qubits going to Alice and Bob, then for those qubits for which they share compatible basis, their measurement outcome if not perfectly anti-correlated, warns Alice and Bob that some nefarious activity has been done by Eve. They may share a part of the key publicly to verify whether tampering has been done. Hence the presence of an eavesdropper is always detected in QKD (as was not in classical cryptographic schemes).

Table 3.2: Detection of tampering by Alice and Bob

Alice's qubit	Measurement axis	Measurement outcome	Bob's qubit	Measurement axis	Measurement outcome	Correlation	Cause
A1	σ_1	↑	B1	σ_3	↑	⊗	different basis
A2	σ_3	↑	B2	σ_3	↑	⊗	Eve

Practical Challenges

The protocol will work 100 % of the times, provided there are no glitches in the quantum communication channel. But in practical situations errors always creep into the channel. Hence, even if Eve has been up to no tampering, Alice and Bob's outcomes will show some arbitrary correlations. This is because of decoherence of qubits. It means that the entangled qubits lose their entanglement over space and time.

Table 3.3: Depiction of channel error

Alice's qubit	Measurement axis	Measurement outcome	Bob's qubit	Measurement axis	Measurement outcome	Correlation	Cause
A1	σ_1	↑	B1	σ_3	↑	⊗	different basis
A2	σ_3	↑	B2	σ_3	↑	⊗	Eve
A3	σ_3	↓	B3	σ_3	↓	⊗	Channel error

There are several ways in which the protocol can be enhanced to reduce the error due to channel imperfections, some of them being quantum error correction, classical privacy amplification etc. There is a lot of improvement scope in this area.

4. Conclusions And Perspectives

With tremendously increasing investments in Quantum Computing from both governments and large companies, the *post-quantum era* is approaching faster than expected. Thus, the actual need for quantum-safe security mechanism in some prone applications like military, banking etc. is clear today. Quantum Key Distribution is just a starting milestone in the path towards perfectly quantum-secure communication. In recent years, there has been a lot of commercial interest in this field and several quantum cryptographic tools have been commercialized by ID-Quantique, QUANTIS etc. It is our personal opinion, that as the technology continues to improve, QKD will be an increasingly valuable tool in a cryptographer's toolbox!

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Expectation and Level of Satisfaction on LPG Customers in Thanjavur District

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Introduction

LPG is the gas at atmospheric pressure and normal ambient temperatures, but it can be liquefied when moderate pressure is applied or when the temperature is sufficiently reduced. It can be easily condensed, packaged, stored and utilized, which makes it an ideal energy source for a wide range of applications. Normally, the gas is stored in liquid form under pressure in a steel container, cylinder or tank. The pressure inside the container will depend on the type of LPG (commercial butane or commercial propane) and the outside temperature. Convenience is one of the main reasons why the use of LPG has been growing worldwide. The LPG heats quickly and provides much greater efficiency than even the most improved biomass stoves. LPG stoves can also be controlled more precisely to match the user's requirements and can save time for cooking and cleaning the kitchen. Additionally, LPG can be transported, stored and used virtually anywhere.

The main challenges for broader dissemination of the LPG are its limited accessibility and affordability for its users. Furthermore, lack of awareness of the LPG as well as fear of accidents exists. The development of governmental policies and regulations to create incentives for increasing LPG use are therefore advisable to support the LPG uptake. A review of experiences in 20 developing countries have revealed that, apart from a stable political and legal system, proper rules governing trade and investments such as the licensing of distribution, repatriation of profits and taxation of corporate profits are also essential for increasing LPG growth. Further possible government interventions include designing favourable taxes/duties, industrial safety provisions and stronger enforcement procedures. This will also create incentives for distribution companies to develop commercial LPG infrastructure and ensure regular supply on a broad basis with close proximity to households. Affordability could be further improved by providing microcredit or loans for the sake of lowering upfront payments or by installing structures that allow poorer households to purchase small amounts of LPG, much in the same way they purchase kerosene or charcoal.

However, with rising international prices of LPG having witnessed an average rate of 9 percent since 2001, subsidies have become increasingly unsustainable as governments are no longer able to shoulder the financial burdens. The removal of subsidies as well as continuously increasing LPG prices bear the well-founded risk that many middle-income urban users might revert to the use of charcoal or fire wood as they are not able to pay for LPG. Nonetheless, it has to be noted that the G20 nations called for a complete phase out of fossil fuels. An estimated 775 billion USD were spent globally on subsidies in 2012. A decisive factor for LPG growth is establishing an appropriate price level for LPG in relation to the prices of other fuels.

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Statement of the Problem

Domestic LPG today is subsidized and hence is distributed only by public sector oil marketing companies. As LPG distribution is controlled, each distributor has a specified area of operation and customers can avail the cylinders only if they are residing within the area of operation of a distributor. The use of India's indigenous production of LPG has not been able to keep pace with increasing demand. For availing the new connection customer has to approach the nearest distributor. Though there is a lot of LPG innovative service available at the reach of consumers in market in Tamil Nadu, the LPG distributors concentrate more in prompt delivery service.

Objectives of the Study

Following are the objectives of the study:

1. To analyze the customer ship profile towards the LPG gas in the Thanjavur District.
2. To identify the expectations of the LPG customers in Thanjavur District.
3. To measure the level of satisfaction of the customers towards the LPG in the study area.

Scope of the Study

The scope of the study is mainly relates to the marketing and consumer expectation towards the domestic LPG. It also helps to find out the satisfaction level of consumer. The scope of the study seems to be vast because of its coverage and contents. The study helps the researcher to have a practical exposure in this specific field. The study results will be of a great help to the government as well as the company in future distribution policy making

Hypothesis

Table – 1: ANOVA test for gender of the respondents and the expectation factors of LPG customers

Expectation factors of LPG customers	F – Value	Significant Value
Seven day functioning of the Gas agent	1.984	.159
Reduction in price	2.782	.096
Quick response of the salesmen	.893	.345
Concessions or subsidies	.346	.556
Standard Government Policies	.200	.655
Immediate customer service	.428	.513
Good customers relationship management	1.992	.159
Increase additional dealers	2.897	.089
Periodical checking up of the cylinder	.079	.779
Good Behavior of counter staff/Deliverymen and Mechanic	3.022	.083
Need training to minimize the gas consumption	.472	.492

Source: Output generated from SPSS 20

Based on the result generated by SPSS 20, the significant values of all the variables related to the expectation of LPG customers are greater than 0.05. So the null hypothesis is accepted in all these cases. Therefore, there is no significant relationship between the mean score of gender of the respondents and the expectation of LPG customers.

In the case of gender of the customers and their expectation, all the customers demand the 11 expectation factors irrespective of the gender. It means the expectation is common to all. So, the gender does not take any influence part in this regard.

Mean and Standard Deviation for Satisfaction of the LPG Customers

Table – 2: Satisfaction of the LPG customers

Satisfaction of the LPG customers	Mean	Std. Deviation
Price of the LP Gas	5.24	1.216
Approach of the Staff of Agent's office	5.35	1.191
Location of the shop	5.32	1.194
Advertisement	5.15	1.262
Customer relationship of the Agent	5.24	1.200
Reliability of the Gas	5.29	1.113
Relationship with the Agent	5.27	1.386
Information providing by the agent/ gas supplying servant	5.37	1.121
Grievance handling procedure	5.26	1.145

Source: Output generated from SPSS 20

Among the 11 satisfaction variables, 'Information providing by the agent/ gas supplying servant' has the maximum mean value (5.37) and it implies that the customers are satisfied with the information service. Next, 'Approach of the Staff of Agent's office' (mean value 5.35) comes and it is inferred that the behavioral approach of the gas agency staff is amicable one. The satisfaction relating to the 'Location of the shop' (mean value 5.32) is good in view of the customers. The location of the gas agency is in centre place of the town so that the customers are satisfied with it. Reliability of the Gas (mean value 5.29) is an important one because many malpractices are done during the delivery of cylinder. But, the customers of the present study are satisfied with this so that it is sure that the performance of the gas agency is good.

Findings of the Study

- ✓ Among the 11 expectation factors, 'need training to minimize the gas consumption' has the maximum value of mean (5.53). It means that the maximum number customers want to be acquainted with the minimum usage of consumption of gas
- ✓ The dimension "satisfaction of the LPG customers comprises 9 factors.
- ✓ The factors are (1) Approach of the Staff of Agent's office
- ✓ (2) Relationship with the Agent. This means that the LPG customers are satisfied with the approach of the Staff of Agent's office and
- ✓ (3) Relationship with the Agent. So, their rating towards the two factors is high. It results in more concentration on the total satisfaction.

Conclusion

It is absolutely to satisfy the customer needs. Keeping this in mind, this study has been conducted at Thanjavur District to identify the customers' attitude and satisfaction towards the domestic LPG services. The findings of the study depict that the customers has faced the irregularity of price increase and delayed supply of LPG gas cylinders. What this study

makes clear is that understanding the consumer behavior of the LP gas and identifying their needs.

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The Determinants of Less Cash Economy

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Abstract

*Less cash economy means an economy in which majority of financial transaction performed by digital modes instead of physical form of money. Digital modes include pay through cheque, demand draft, plastic card, smart phone apps, POS terminal, RTGS and NEFT etc. Sweden is the first country which introduces concept of cashless economy and at present this country near to cashless economy. **This study is undertaking to examine the impact of demographics i.e. gender, age, educational qualification, occupation, and geographical background on determinants of less cash economy, to study the modes of cashless payment/ digital payment and study the factors affecting the less. The less cash economy is the need of the day. Lot of efforts is being made in this direction. Less cash economy effected by factors such as digital literacy, lack of infrastructure, safety and security, connectivity, poor banking habits, language problem, modern technology, service charges, less printing cost of currency, convenience, solution for currency shortage, reduce black money, fight against fake currency, government schemes, exemption from tax, freebies etc. Thus it can be concluded that the above factors must be considered to make a less cash economy or digital economy.***

Key words: cashless economy, RTGS, batter system, debit card, POS.

Introduction

Less cash economy means an economy in which majority of financial transaction performed by digital modes instead of physical form of money. Digital modes include pay through cheque, demand draft, plastic card, smart phone apps, POS terminal, RTGS and NEFT etc. Indian economy is cash oriented economy because maximum Indian citizen prefers pay through cash. According to “MasterCard advisor’s measuring progress toward a cashless society” in India only 2% transaction are performed through cashless modes and 98% transaction are performed with physical money. Although cashless payment percentage is continuously increased in India after the announcement of demonetization of Rs. 500 and Rs. 1000 note (8 Nov, 2016). Indian government and RBI promote the individuals for doing payment through cashless instruments by discount, cash back and lucky draw scheme.

Sweden is the first country which introduces concept of cashless economy and at present this country near to cashless economy. According to the belief of this country, if a person has more cash then he will be considered a terrorist (www.businessinsider.in). According to Jhunjhunwala cashless economy increases 1.5% income of government. Sweden and Denmark is near about cashless economy due to negative interest rate. For example, if you deposit 1000 kronor in Sweden central bank, it will give 995 kronor after one year due to negative interest rate -.5%. Norway and South Korea will become cashless by 2020.

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Concept of less cash or cashless economy in India

“Our dream is that there should be cashless society. This is also correct that 100% cashless society is never possible. But we can make a start with less cash society then cashless society will not be a far –off destination.” Narendra Modi said in “Mann ke Baat” address appealing to youth to teach 10 families daily on how they could do cashless transaction through mobile apps, mobile banking and debit/ credit card.

“Let’s start with less cash society to move to cashless India, said PM Modi.

(Source: Economic times as on 27 Nov, 2016)

Definition

Less cash economy can be defined as an economy in which cash is not used for financial transaction and all transactions are done through digital mode instead of physical currency. Digital modes like debit card, credit card, electronic fund transfer channel such as IMPS, NEFT, RTGS, etc. phone apps like BHIM app, AAPS, USSD, UPI, POS, E-Wallet QR code.

International scenario

On the basis of Forex Bonuses survey Canada is top cashless economy in the world and get first rank with 6.48 score and approximated 57% of financial transactions performed through cashless modes. Second cashless country is Sweden where 59% transactions are cashless. After Sweden, France and United Kingdom is positioned at third and fourth place respectively. In case of cashless payments, United States and China are not far. Australia, Germany and Japan also gradually move to the cashless economy from cash based economy. In Russia only 4% transaction are cashless. Therefore this country gets 10th rank out of list of top 10 cashless countries. Here score is given on the basis of debit and credit card users, growth rate of cashless payments and awareness about digital payment among customers.

Determinants of less cash / cashless economy

Determinant of cashless means challenges which are hurdle on the path of introducing less cash or cashless economy. Following are the factors which affect the less cash economy:-

1. Poor network connectivity

Maximum population of India lives in rural area. Till now many remote areas especially rural areas do not get internet connection. Maximum modes of cashless payment depend on internet. Due to this, they cannot use cashless payment system. Following table shows internet users countries in the world. Above table shows percentage of internet users across the world. Here Britain is at the top, where 94% people use internet. Second and third internet user’s countries are Japan and Australia respectively. In India only 29% populations use internet service which is less than as compared to Chain.

2. Internet cost

For cashless payment internet is necessary, but monthly internet pack is costly and there is no Wi-Fi facility at public place. Although *Reliance jio* has overcome this problem to some extent but jio operates on 4G smart phone.

3. Language

Indian constitution recognized 22 languages. Due to large size of population and different culture in India, different people speak different language. But internet mainly based on English. Other than this, plastic card details are in English and messages related with banking transaction are also in English or Hindi. This creates problems to those people

who not know either English or Hindi. Due to this customer switch to pay through cash instead of pay for card or digital mode.

4. Illiteracy

Majority of Indian population who belongs to lower class, middle class especially senior citizen, are not educated. They are not aware how to use internet and smart phone, how to make payment through cashless modes, etc. They are not aware about banking policies, government scheme for performing cashless payment such as discount, cash back, lucky draw scheme etc. Hence illiteracy is an obstacle on the way of less cash economy.

5. Infrastructure

Less bank branches in rural areas, limited POS machine and limited ATM machines, old operating system is barrier to adopting cashless payment system. On the other hand merchant, shopkeepers, retailers required POS machine, internet connection for doing cashless transactions. During February, RBI issue 206659 ATM machine and 3079487 POS terminal which are less as compared to Indian population which was 121 crore according to censuses survey- 2011. There should be one ATM machine for at least one lakh population.

6. Privacy and security

In India some people do not use cashless payment due to surety and privacy of transactions. Banks do not guarantee to customers to keep data private and secure. Thus, generally people fear that their data will be leaked to public and misused by companies. Hence security is also affects the cashless payment system. Also Bank use old operating system which is least secure for financial transaction.

7. Cost of swipe machine

When hire POS machine merchants pay fixed monthly rent and pay transaction charges 1%- 2% of transaction amount to banks. These are charge for business running cost but these charges are recovered from customers by merchant. Due to this customer pay more amounts as compared to actual amount. So they switch to physical money for payment.

Statement of Problem

This study tries to find out the answer of question why Indian people do not adopt less cash/ cashless economy and what are the factors which encourage people to do cashless payment/ digital payment. Thus statement of problem is "Determinants of less cash economy."

Literature Review

Kaur (2017) focused on impact of demonetization on making India cashless economy. Finding depicts that due to demonetization concept of cashless economy become more popular. Because of demonetization various new online modes are introduced. It is also concluded cashless transaction are less costly as well as less time consuming and can perform any time and from anywhere.

Kumar (2017) discussed the role of demonetization in India, status of digital payment in India and examined top cashless countries in the world. This article is theoretical and based on secondary data. It was observed India moves step by step to cashless payment system from cash based payment system. Now adoption of cashless payment system is need of Indian citizens because of all web based markets are based on digital payments.

Ragaventhara (2016) analyzed the Challenges and benefits of cashless economy. It was observed that there are so many benefits as well as challenges of cashless payment system

mainly security factor. If people are taught to use cashless payment instrument, computer and smart phones, then they can take the advantages of cashless payment system.

Ramya (2016) analyzed the modes, advantages and disadvantages of cashless system. It is argued that result of using cashless transaction is better transparency, measurability and check on fake currency and black money. Using habits of cashless transaction system can be increased by improving the infrastructure and security system.

Duemmler and Kienle (2012) analyzed the role of a central bank of Germany in promoting cashless payment. Finding reveals that central bank play important role for making cashless payment because economic cost of central bank services is less as compared to private bank in Germany.

Objectives of the Study

Following are the objectives of this study:-

- To study the modes of cashless payment/ digital payment.
- To study the factors affecting the less cash economy.
- To study the impact of demographics i.e. age, educational qualification, occupation, and geographical background on determinants of less cash economy.

Hypothesis

On the basis of the objectives of the study following hypothesis has been formulated:

➤ H₀: there is no significant effect of different age group on the less cash economy

H₁: there is significant effect of different age group on the less cash economy

➤ H₀: there is no significant effect of educational qualification, geographical background and occupation on the less cash economy

H₁: there is significant effect of educational qualification, geographical background and occupation on the less cash economy

Research Methodology

The study is empirical in nature which based on primary data as well as secondary data. Primary data is collected through questionnaire from 200 respondents of different age group from Yamunanagar (Haryana). Secondary data is collected from different website, journal and books. Factor analysis, ANOVA, and Simple percentage statistical technique are used to analysis of the data.

ANALYSIS AND INTERPRETATIONS

Table: 1Details of Extracted factor

S. No.	Factors effecting less cash economy	Factor loading
Factor 1: Digital literacy		
1	Knowledge of smart phone usage	.800
2	Guidance to make cashless payment	.759
3	Knowledge the cashless modes of payment	.694
4	Less aware about the internet usage	.644
5	Knowledge of running a computer	.630
6	Knowledge of procedure of cashless payment	.601
Factor 2: Lack of infrastructure		
1	Bank branch in all villages	.775
2	Swipe machine to all retailers	.734
3	ATM machine	.555
4	Bank account	.550

5	Smart phone	.549
6	Debit/ credit cards	.519
7	Power supply / long power cut	.479
8	Merchants does not have swipe machines	-.484
Factor 3: Safety and Security		
1	Security to financial transaction performed through ATM	.819
2	Use of PIN and Password to protect	.756
3	Security transaction from fraud	.664
4	Security of Personal data	.652
5	Security against unauthorized access	.524
Factor 4: Network connectivity		
1	Poor internet connectivity	.506
2	Internet cost increase after implement CTS	-.355
Factor 5: Poor banking habits		
1	Poor banking habits	.804
2	Merchants not accept payment in cashless ways	.503
Factor 6: Language problem		
1	English as financial transaction language	.766
2	Language problem	.720
Factor 7: Modern technology		
1	Latest software	.760
2	Up- to-date equipment and technology	.602
Factor 8: Service charges		
1	Transaction cost or service charges	.570
Factor 9: Less printing cost of currency		
1	Reduces printing cost of currency	.721
Factor 10: Convenience		
1	Offer discount and reward point	.811
2	Easy to pay	.729
3	Saves time	.717
4	Performed any time and from anywhere	.693
5	No need to wait	.614
6	No time boundation	.517
Factor 11: Solution for currency shortage		
1	Overcomes the problems of shortage of currency note	.722
Factor 12: Reduce black money		
1	Reduces black money	.700
Factor 13: Fight against fake currency		
1	Fight against fake currency	.745
Factor 14: Government schemes		
1	Scheme/ discount	.720
2	Government schemes	.696
Factor 15: Exemption from tax		
1	Exemption of tax on online transaction	.561

2	Monthly rent of POS	.527
Factor 16: Freebies		
1	Offer 10% discount by toll plazas	.719
2	Petroleum offers discount	.466
3	Digital infrastructure in rural areas	.391

Table 1 shows summary of 16 factors that affect cashless economy

Comparative analysis

Factor Analysis extracted sixteen factors which are the determinant of less cash economy. Extracted factors further analyzed with ANOVA to test the impact of these factors on less cash economy on the basis of demographic variable (age, sex, educational qualification, occupation, and geographical background).

Table 2A: Residential status based summary of ANOVA

Determinant of less cash economy		Sum of Squares	Df	Mean Square	F	Sig.
Digital literacy	Between Groups	9.861	1	9.861	1.030	.311
	Within Groups	1894.859	198	9.570		
	Total	1904.720	199			
Lack of infrastructure	Between Groups	47.862	1	47.862	5.114	.025**
	Within Groups	1852.933	198	9.358		
	Total	1900.795	199			
Safety and security	Between Groups	59.631	1	59.631	12.203	.001**
	Within Groups	967.549	198	4.887		
	Total	1027.180	199			
Network connectivity	Between Groups	1.291	1	1.291	.813	.368
	Within Groups	314.264	198	1.587		
	Total	315.555	199			
Poor banking habits	Between Groups	1.725	1	1.725	.787	.376
	Within Groups	433.795	198	2.191		
	Total	435.520	199			
Language problem	Between Groups	4.959	1	4.959	1.500	.222
	Within Groups	654.541	198	3.306		
	Total	659.500	199			
Modern technology	Between Groups	1.523	1	1.523	1.717	.192
	Within Groups	175.672	198	.887		
	Total	177.195	199			
Service charges	Between Groups	1.325	1	1.325	1.644	.201
	Within Groups	159.550	198	.806		
	Total	160.875	199			
Less printing cost of currency	Between Groups	.760	1	.760	1.216	.272
	Within Groups	123.795	198	.625		
	Total	124.555	199			
Convenience	Between Groups	.581	1	.581	.049	.825
	Within Groups	2348.439	198	11.861		
	Total	2349.020	199			
Solution for currency shortage	Between Groups	.365	1	.365	.659	.418
	Within Groups	109.635	198	.554		
	Total	110.000	199			
reduce black money	Between Groups	.011	1	.011	.017	.895
	Within Groups	127.109	198	.642		
	Total	127.120	199			

Fight against fake currency	Between Groups	1.982	1	1.982	3.159	.077
	Within Groups	124.213	198	.627		
	Total	126.195	199			
Government schemes	Between Groups	5.817	1	5.817	2.374	.125
	Within Groups	485.138	198	2.450		
	Total	490.955	199			
Exemption from tax	Between Groups	.129	1	.129	.071	.790
	Within Groups	356.746	198	1.802		
	Total	356.875	199			
Freebies	Between Groups	.855	1	.855	.230	.632
	Within Groups	735.020	198	3.712		
	Total	735.875	199			

*Level of significant is 5%, ** significant value

Table: 2 BResidential statuses based descriptive statistics of determinants of less cash economy

Determinant of less cash economy		Mean	Std. Deviation
Digital literacy	Rural	24.07	3.171
	Urban	23.60	2.925
Lack of infrastructure	Rural	33.44	3.019
	Urban	32.40	3.141
Safety and security	Rural	22.09	1.945
	Urban	20.92	2.683
Network connectivity	Rural	8.14	1.271
	Urban	7.97	1.237
Poor banking habits	Rural	8.24	1.417
	Urban	8.05	1.605
Language problem	Rural	8.06	1.795
	Urban	7.72	1.867
Modern technology	Rural	8.84	.976
	Urban	9.03	.865
Service charges	Rural	4.28	.895
	Urban	4.11	.904
Less printing cost of currency	Rural	4.38	.836
	Urban	4.25	.685
Convenience	Rural	24.61	3.488
	Urban	24.49	3.350
Solution for currency shortage	Rural	4.43	.718
	Urban	4.34	.796
reduce black money	Rural	4.39	.801
	Urban	4.37	.802
Fight against fake currency	Rural	4.47	.751
	Urban	4.26	.871
Government schemes	Rural	6.87	1.634

	Urban	7.23	1.412
Exemption from tax	Rural	8.01	1.396
	Urban	8.06	1.223
Freebies	Rural	11.23	1.977
	Urban	11.37	1.816

The summary of ANOVA reveals that F – Value of ‘safety and security’ at df – 1/199, $p < .001$ is 12.203 which is greater than the table value. Hence we reject the null hypothesis and concluded that residential area influence the less cash economy. According to the highest mean score of this factors for rural area indicates that rural people are more worried about ‘Safety and security’ of digital transactions than urban people.

F – Value of ‘lack of infrastructure’ is significant. F- Value of this factor at df – 1/199, $p < .025$ is 5.114 which is greater than the table value. Hence we reject the null hypothesis and concluded that limited of infrastructure have negative impacts on the less cash economy. According to the highest mean score of this it can be inferred that rural people consider ‘Lack of infrastructure’ as important factor as compared to urban people, may be because rural area is lack of infrastructure for digital transactions.

The insignificant F- value highlights that there is no significant difference between remaining factors. Thus, it can be concluded that respondents of different residential areas are giving equal importance to digital literacy, language problem, fight against fake currency, modern technology, Service charges, government schemes, less printing cost of currency, network connectivity, poor banking habits, convenience, solution for currency shortage, reduce black money, exemption from tax, Freebies”.

Table – 3 A: Age based summary of ANOVA

Determinant of less cash economy		Sum of Squares	Df	Mean Square	F	Sig.
Digital literacy	Between Groups	50.948	3	16.983	1.796	.149
	Within Groups	1853.772	196	9.458		
	Total	1904.720	199			
Lack of infrastructure	Between Groups	20.552	3	6.851	.714	.545
	Within Groups	1880.243	196	9.593		
	Total	1900.795	199			
Safety and security	Between Groups	20.430	3	6.810	1.326	.267
	Within Groups	1006.750	196	5.136		
	Total	1027.180	199			
Network connectivity	Between Groups	.650	3	.217	.135	.939
	Within Groups	314.905	196	1.607		
	Total	315.555	199			
Poor banking habits	Between Groups	7.657	3	2.552	1.169	.323
	Within Groups	427.863	196	2.183		
	Total	435.520	199			
Language problem	Between Groups	19.325	3	6.442	1.972	.119
	Within Groups	640.175	196	3.266		
	Total	659.500	199			
Modern technology	Between Groups	1.111	3	.370	.412	.744
	Within Groups	176.084	196	.898		
	Total	177.195	199			
Service charges	Between Groups	2.733	3	.911	1.129	.338
	Within Groups	158.142	196	.807		
	Total	160.875	199			
Less printing cost of	Between Groups	1.123	3	.374	.594	.619

currency	Within Groups	123.432	196	.630		
	Total	124.555	199			
Convenience	Between Groups	56.757	3	18.919	1.618	.187
	Within Groups	2292.263	196	11.695		
	Total	2349.020	199			
Solution for currency shortage	Between Groups	1.599	3	.533	.964	.411
	Within Groups	108.401	196	.553		
	Total	110.000	199			
Reduce black money	Between Groups	2.002	3	.667	1.045	.374
	Within Groups	125.118	196	.638		
	Total	127.120	199			
Fight against fake currency	Between Groups	3.148	3	1.049	1.672	.174
	Within Groups	123.047	196	.628		
	Total	126.195	199			
Government schemes	Between Groups	11.708	3	3.903	1.596	.192
	Within Groups	479.247	196	2.445		
	Total	490.955	199			
Exemption from tax	Between Groups	17.008	3	5.669	3.269	.022**
	Within Groups	339.867	196	1.734		
	Total	356.875	199			
Freebies	Between Groups	3.413	3	1.138	.304	.822
	Within Groups	732.462	196	3.737		
	Total	735.875	199			

*Level of significant is 5%, ** significant value

Table -3B: Agebased descriptive statistics of determinants of less cash economy

Determinant of less cash economy		Mean	Std. Deviation
Digital literacy	<20	25.86	1.864
	20-40	23.82	2.887
	40- 60	23.60	3.486
	>60	25.30	4.270
	Total	23.92	3.094
Lack of infrastructure	<20	33.00	3.162
	20-40	33.04	3.212
	40- 60	33.00	2.777
	>60	34.50	2.635
	Total	33.14	3.196
Safety and security	<20	20.86	3.132
	20-40	21.59	2.244
	40- 60	22.00	2.340
	>60	22.70	1.418
	Total	21.79	2.534
Network connectivity	<20	7.86	1.215
	20-40	8.11	1.303
	40- 60	8.02	1.185
	>60	8.10	1.101
	Total	7.97	1.201
Poor banking habits	<20	8.14	1.574
	20-40	8.24	1.398
	40- 60	7.86	1.767
	>60	8.70	1.059
	Total	8.13	1.449

Language problem	<20	7.29	1.799
	20-40	7.93	1.794
	40- 60	7.84	1.999
	>60	9.20	.789
Modern technology	<20	8.57	.976
	20-40	8.91	.913
	40- 60	8.98	1.035
	>60	8.80	1.033
Service charges	<20	4.71	.756
	20-40	4.23	.884
	40- 60	4.09	.971
	>60	4.40	.843
Less printing cost of currency	<20	4.00	1.000
	20-40	4.33	.826
	40- 60	4.37	.691
	>60	4.50	.527
Convenience	<20	24.71	2.984
	20-40	24.79	3.314
	40- 60	24.33	3.496
	>60	22.40	4.695
Solution for currency shortage	<20	4.57	.535
	20-40	4.34	.775
	40- 60	4.51	.703
	>60	4.60	.516
reduce black money	<20	4.71	.488
	20-40	4.34	.838
	40- 60	4.37	.757
	>60	4.70	.483
Fight against fake currency	<20	4.57	.535
	20-40	4.33	.869
	40- 60	4.63	.536
	>60	4.40	.699
Government schemes	<20	6.29	2.360
	20-40	6.89	1.503
	40- 60	7.37	1.543
	>60	7.20	1.874
Exemption from tax	<20	6.86	1.864
	20-40	8.12	1.226
	40- 60	7.77	1.461
	>60	8.60	1.506
Freebies	<20	10.86	.900
	20-40	11.29	1.906
	40- 60	11.19	2.119
	>60	11.70	1.947

Perception of different age group is different on less cash economy. Summary of ANOVA table- 3A shows that perception of different age group on digital payment.

The significant F- Value of 'exemption from tax' at 5% level of significant is 3.269 which is more than the table value; hence we reject the null hypothesis. This reveals that adoption of less cash economy is effected by tax charged on cashless transaction/ cashless payments. Highest mean score of this factor for age group greater than 60 shows that more people of this age group agree with if tax is not levied on cashless payment then we can easily implement less cash economy as compared to other age group.

F- value of 'digital literacy', 'safety and security', 'lack of infrastructure', 'language problem', 'fight against fake currency', 'modern technology', 'service charges', 'government schemes', 'less printing cost of currency', 'network connectivity', 'poor banking habits', 'convenience', 'solution for currency shortage', 'reduce black money', and 'Freebies' are insignificant. It suggests that respondents are gives equal treatment to these factors irrespective of their age. Therefore, it can be concluded that impact of age of customers will remain same on less cash economy with regard to above mentioned fifteen factors.

Table – 4 A: Summary of ANOVA based on Occupation

Determinants of less cash economy		Sum of Squares	Df	Mean Square	F	Sig.
Digital literacy	Between Groups	67.724	6	11.287	1.186	.315
	Within Groups	1836.996	193	9.518		
	Total	1904.720	199			
Lack of infrastructure	Between Groups	122.036	6	20.339	2.207	.044**
	Within Groups	1778.759	193	9.216		
	Total	1900.795	199			
Safety and security	Between Groups	31.628	6	5.271	1.022	.412
	Within Groups	995.552	193	5.158		
	Total	1027.180	199			
Network connectivity	Between Groups	13.238	6	2.206	1.409	.213
	Within Groups	302.317	193	1.566		
	Total	315.555	199			
Poor banking habits	Between Groups	3.018	6	.503	.224	.968
	Within Groups	432.502	193	2.241		
	Total	435.520	199			
Language problem	Between Groups	18.343	6	3.057	.920	.481
	Within Groups	641.157	193	3.322		
	Total	659.500	199			
Modern technology	Between Groups	5.063	6	.844	.946	.463
	Within Groups	172.132	193	.892		
	Total	177.195	199			
Service charges	Between Groups	1.249	6	.208	.252	.958
	Within Groups	159.626	193	.827		
	Total	160.875	199			
Less printing cost of currency	Between Groups	7.150	6	1.192	1.959	.073
	Within Groups	117.405	193	.608		
	Total	124.555	199			
Convenience	Between Groups	31.628	6	5.271	.439	.852
	Within Groups	2317.392	193	12.007		
	Total	2349.020	199			

Solution for currency shortage	Between Groups	5.285	6	.881	1.623	.143
	Within Groups	104.715	193	.543		
	Total	110.000	199			
Reduce black money	Between Groups	3.715	6	.619	.968	.448
	Within Groups	123.405	193	.639		
	Total	127.120	199			
Fight against fake currency	Between Groups	6.207	6	1.034	1.664	.132
	Within Groups	119.988	193	.622		
	Total	126.195	199			
Government schemes	Between Groups	28.293	6	4.716	1.967	.072
	Within Groups	462.662	193	2.397		
	Total	490.955	199			
Exemption from tax	Between Groups	9.543	6	1.591	.884	.508
	Within Groups	347.332	193	1.800		
	Total	356.875	199			
Freebies	Between Groups	46.297	6	7.716	2.160	.049**
	Within Groups	689.578	193	3.573		
	Total	735.875	199			

*Level of significant is 5%, ** significant value

Table – 4 B: Occupationbased descriptive statistics of determinants of less cash economy

Determinant of less cash economy		Mean	Std. Deviation
Digital literacy	Govt. employee	23.70	3.211
	Private employee	23.71	2.452
	Student	23.99	3.240
	Retired	20.75	5.560
	Business	24.33	1.506
	House wife	23.91	3.432
	Other	25.13	2.500
Lack of infrastructure	Govt. employee	34.13	3.494
	Private employee	32.50	3.218
	Student	32.91	2.815
	Retired	33.50	2.646
	Business	30.17	4.355
	House wife	33.53	2.820
	Other	34.25	2.840
Safety and security	Govt. employee	21.91	2.466
	Private employee	21.38	2.518
	Student	21.84	2.054
	Retired	20.50	2.646
	Business	21.17	3.312
	House wife	21.47	2.339
	Other	22.69	1.493
Network connectivity	Govt. employee	7.57	1.080
	Private employee	8.14	1.354
	Student	8.04	1.224
	Retired	9.25	.500
	Business	8.33	1.366
	House wife	8.21	1.321
	Other	8.25	1.238

Poor banking habits	Govt. employee	8.35	1.555
	Private employee	8.24	1.590
	Student	8.05	1.442
	Retired	8.50	1.291
	Business	8.50	1.517
	House wife	8.18	1.218
	Other	8.19	1.940
Language problem	Govt. employee	7.91	2.065
	Private employee	7.93	1.702
	Student	7.65	1.907
	Retired	8.25	2.363
	Business	8.50	.837
	House wife	8.21	1.591
	Other	8.63	1.928
Modern technology	Govt. employee	8.83	.937
	Private employee	9.00	.765
	Student	8.81	.982
	Retired	9.50	.577
	Business	9.50	.837
	House wife	8.82	.968
	Other	9.00	1.211
Service charges	Govt. employee	4.35	.935
	Private employee	4.17	.824
	Student	4.25	.974
	Retired	4.00	.000
	Business	4.33	1.211
	House wife	4.24	.855
	Other	4.06	.854
Less printing cost of currency	Govt. employee	4.65	.487
	Private employee	4.31	.680
	Student	4.25	.917
	Retired	3.50	1.291
	Business	4.17	.753
	House wife	4.32	.768
	Other	4.63	.500
Convenience	Govt. employee	24.61	3.258
	Private employee	24.40	3.443
	Student	25.03	3.238
	Retired	23.50	4.123
	Business	24.17	2.563
	House wife	24.15	3.971
	Other	24.13	3.810
Solution for currency shortage	Govt. employee	4.48	.790
	Private employee	4.19	.833
	Student	4.40	.771
	Retired	4.00	.000
	Business	5.00	.000
	House wife	4.50	.663
	Other	4.50	.516
Reduce black money	Govt. employee	4.48	.898
	Private employee	4.33	.721
	Student	4.37	.835
	Retired	3.75	1.258

	Business	4.17	.408
	House wife	4.35	.849
	Other	4.69	.479
Fight against fake currency	Govt. employee	4.65	.487
	Private employee	4.33	.687
	Student	4.33	.949
	Retired	4.00	1.414
	Business	3.83	1.169
	House wife	4.50	.615
	Other	4.69	.479
Government schemes	Govt. employee	7.26	1.657
	Private employee	7.21	1.317
	Student	6.55	1.491
	Retired	8.00	1.155
	Business	7.83	1.602
	House wife	7.09	1.747
	Other	7.25	1.807
Exemption from tax	Govt. employee	8.48	1.123
	Private employee	7.88	1.273
	Student	8.01	1.380
	Retired	8.50	1.291
	Business	8.33	1.033
	House wife	7.76	1.458
	Other	8.13	1.455
Freebies	Govt. employee	12.48	1.377
	Private employee	11.31	2.089
	Student	11.00	1.945
	Retired	11.25	1.258
	Business	11.83	.983
	House wife	10.88	1.981
	Other	11.38	1.821

On the basis of occupation summary of ANOVA table shows that significant F-Value of 'lack of infrastructure' and 'freebies' at df- 6/193 is 2.207, 2.160 respectively which is greater than the table value. Hence we reject null hypothesis and concluded that on the basis of occupation there is no significant difference of these factors on less cash economy. Highest mean value of government employee posits lack of infrastructure and freebies as an important factor for less cash economy as compared to people of other occupation. 'Digital literacy, safety and security, language problem, fight against fake currency, modern technology, service charges, government schemes, less printing cost of currency, network connectivity, poor banking habits, convenience, solution for currency shortage, reduce black money, and exemption from tax yield non-significant F-value 1.186, 1.022, .920, 1.664, .946, .252, 1.967, 1.959, 1.409, .224, .439, 1.623, .968, and .884 respectively suggesting thereby occupation does not make any difference on above in determinants of less cash economy.

Table – 5A: Summary of ANOVA based on Qualification

Determinants of less cash economy		Sum of Squares	df	Mean Square	F	Sig.
Digital literacy	Between Groups	114.798	3	38.266	4.190	.007**
	Within Groups	1789.922	196	9.132		
	Total	1904.720	199			
Lack of infrastructure	Between Groups	61.252	3	20.417	2.175	.092
	Within Groups	1839.543	196	9.385		
	Total	1900.795	199			
Safety and security	Between Groups	3.176	3	1.059	.203	.894
	Within Groups	1024.004	196	5.225		
	Total	1027.180	199			
Network connectivity	Between Groups	3.647	3	1.216	.764	.516
	Within Groups	311.908	196	1.591		
	Total	315.555	199			
Poor banking habits	Between Groups	.336	3	.112	.050	.985
	Within Groups	435.184	196	2.220		
	Total	435.520	199			
Language problem	Between Groups	12.441	3	4.147	1.256	.291
	Within Groups	647.059	196	3.301		
	Total	659.500	199			
Modern technology	Between Groups	.851	3	.284	.315	.814
	Within Groups	176.344	196	.900		
	Total	177.195	199			
Service charges	Between Groups	1.628	3	.543	.668	.573
	Within Groups	159.247	196	.812		
	Total	160.875	199			
Less printing cost of currency	Between Groups	.186	3	.062	.098	.961
	Within Groups	124.369	196	.635		
	Total	124.555	199			
Convenience	Between Groups	132.523	3	44.174	3.906	.010**
	Within Groups	2216.497	196	11.309		
	Total	2349.020	199			
Solution for currency shortage	Between Groups	.080	3	.027	.047	.986
	Within Groups	109.920	196	.561		
	Total	110.000	199			
Reduce black money	Between Groups	1.586	3	.529	.826	.481
	Within Groups	125.534	196	.640		
	Total	127.120	199			
Fight against fake currency	Between Groups	.958	3	.319	.500	.683
	Within Groups	125.237	196	.639		
	Total	126.195	199			
Government schemes	Between Groups	7.950	3	2.650	1.075	.361

	Within Groups	483.005	196	2.464		
	Total	490.955	199			
Exemption from tax	Between Groups	3.466	3	1.155	.641	.590
	Within Groups	353.409	196	1.803		
	Total	356.875	199			
Freebies	Between Groups	2.000	3	.667	.178	.911
	Within Groups	733.875	196	3.744		
	Total	735.875	199			

*Level of significant is 5%, **significant value

Table –5 B: Qualificationbased descriptive statistics of determinants of less cash economy

Determinants of less cash economy		Mean	Std. Deviation
Digital literacy	Up to 12	25.48	2.931
	Diploma	24.71	2.369
	Graduate	23.70	2.941
	Post graduate and Research studies (M.Phil/Ph.D)	23.27	3.349
	Total	23.92	3.094
Lack of infrastructure	Up to 12	34.56	2.873
	Diploma	32.77	3.201
	Graduate	32.89	3.005
	Post graduate and Research studies (M.Phil/Ph.D)	32.96	3.121
	Total	33.11	3.091
Safety and security	Up to 12	21.96	2.189
	Diploma	21.48	2.502
	Graduate	21.73	2.226
	Post graduate and Research studies (M.Phil/Ph.D)	21.70	2.280
	Total	21.71	2.272
Network connectivity	Up to 12	8.12	1.130
	Diploma	7.77	1.117
	Graduate	8.17	1.372
	Post graduate and Research studies (M.Phil/Ph.D)	8.12	1.249
	Total	8.09	1.259
Poor banking habits	Up to 12	8.28	1.646
	Diploma	8.16	1.734
	Graduate	8.19	1.397
	Post graduate and Research studies (M.Phil/Ph.D)	8.15	1.411
	Total	8.18	1.479
Language problem	Up to 12	8.48	1.686
	Diploma	8.03	1.643
	Graduate	8.00	1.761
	Post graduate and Research studies (M.Phil/Ph.D)	7.69	1.972
	Total	7.95	1.820
Modern technology	up to 12	8.80	1.118
	Diploma	8.90	.746

	Graduate	8.99	1.000
	Post graduate and Research studies (M.Phil/Ph.D)	8.86	.911
	Total	8.91	.944
Service charges	Up to 12	4.12	.971
	Diploma	4.42	.765
	Graduate	4.23	.920
	Post graduate and Research studies (M.Phil/Ph.D)	4.18	.912
	Total	4.23	.899
Less printing cost of currency	Up to 12	4.36	.860
	Diploma	4.39	.803
	Graduate	4.30	.823
	Post graduate and Research studies (M.Phil/Ph.D)	4.34	.745
	Total	4.34	.791
Convenience	Up to 12	22.84	4.017
	Diploma	24.23	3.232
	Graduate	25.44	2.749
	Post graduate and Research studies (M.Phil/Ph.D)	24.47	3.691
	Total	24.57	3.436
Solution for currency shortage	Up to 12	4.40	.645
	Diploma	4.35	.915
	Graduate	4.41	.648
	Post graduate and Research studies (M.Phil/Ph.D)	4.41	.792
	Total	4.40	.743
Reduce black money	Up to 12	4.60	.707
	Diploma	4.35	.915
	Graduate	4.39	.804
	Post graduate and Research studies (M.Phil/Ph.D)	4.31	.775
	Total	4.38	.799
Fight against fake currency	Up to 12	4.32	.748
	Diploma	4.52	.570
	Graduate	4.34	.866
	Post graduate and Research studies (M.Phil/Ph.D)	4.45	.830
	Total	4.41	.796
Government schemes	Up to 12	7.48	1.711
	Diploma	6.84	1.809
	Graduate	6.86	1.386
	Post graduate and Research studies (M.Phil/Ph.D)	7.00	1.579
	Total	6.99	1.571
Exemption from tax	Up to 12	7.92	1.778
	Diploma	7.77	1.606
	Graduate	8.16	1.175
	Post graduate and Research studies (M.Phil/Ph.D)	8.04	1.199
	Total	8.03	1.339

Freebies	Up to 12	11.12	2.108
	Diploma	11.48	1.895
	Graduate	11.26	1.775
	Post graduate and Research studies (M.Phil/Ph.D)	11.26	2.034
	Total	11.28	1.923

The ANOVA table 5(B) indicates the significant F – Value of ‘digital literacy’ at df – 3/196 is 4.190 which is greater than the table value. Hence we reject the null hypothesis and concluded that educational qualification influence the less cash economy. High mean score of these factors is for qualification up to 12th standard which indicates that customers upto 12th standard qualification have more problem of ‘digital literacy, language and limited infrastructure’ than higher qualified people.

The significant F value of ‘convenience’ is 3.906 at df- 3/196 $p < .010$, reveals that people of different qualification differ on convenience factor. The highest mean score (table 31B) of this factor for graduate people reveals that graduate people feel more convenient as compared to people of other qualification.

The insignificant F- value of “Lack of infrastructure, language problem, safety and security, network connectivity, poor banking habits, modern technology, service charges, reduce cost of currency, solution for currency shortage, reduce black money, fight against fake currency, exemption from tax, government schemes and freebies” indicates that people are giving equal treatment to above factor irrespective of qualification. Hence, it can be concluded that education does not make any difference among people with regards to these above mentioned determinants of less cash economy.

Findings

Based on analysis following findings has been emerged:

- ❖ Less cash/ cashless economy creates, clean and transparent economic. Less cash/ cashless economy is beneficiary for government as well as for public. It solve various problems like- black money, corruption, fake currency, problem of changes, fear of theft, transfer of money from anywhere within a minutes, etc.
- ❖ Out of online and offline banking services, mostly people prefers offline banking services.
- ❖ Maximum people choose biometric as security of cashless transactions.
- ❖ In India implementation of less cash economy/ cashless economy is not so easy but also time consuming. Because you need to swipe card on swipe machine, then enter PIN and wait till merchant do not get confirmation.
- ❖ On a Smartphone, some people do not have internet connection, and phone application which supports all language.
- ❖ Cashless transaction means that each and every transaction are tracked and documented which is beneficiary for government because of all transactions are disclosed and taxed. It increases the government income, reduces corruption, black money, expenditure on printing currency and abolition of parallel economy.
- ❖ Security is also a reason not to make cashless payments. The reason of less security of the transactions is not only technology but also lack of awareness about security issue among users.
- ❖ Cashless transaction puts burden of additional charges on consumers and merchants. Customer pays extra charges in form of transaction charges and merchants pay MDR (Merchant Discount Rate).

- ❖ Education, residential status and occupation influence the less cash economy up to some extent.
- ❖ Age does not have any effects on the less cash economy.

Conclusion

The less cash economy is the need of the day. Lot of efforts is being made in this direction. ***Less cash economy effected by factors such as*** digital literacy, lack of infrastructure, safety and security, connectivity, poor banking habits, language problem, modern technology, service charges, less printing cost of currency, convenience, solution for currency shortage, reduce black money, fight against fake currency, government schemes, exemption from tax, freebies etc. Thus it can be concluded that the above factors must be considered to make a less cash economy or digital economy.

Recommendations

The following recommendations are being made in the light of the finding of the present study:

1. For customer awareness towards cashless payment modes, training and educational programs should be conducted. Trainer should make the customers aware about financial and digital literacy as well as how to use related instruments.
2. Poor internet connectivity is big challenges in adopting the less cash economy. So internet facility should be provided by government in villages or remote areas. Government also gives special benefits to networking companies for giving internet service in remote areas.
3. Internet charges should be lower and free Wi-Fi should also provide at public place and remote areas.
4. The government must make cashless payment compulsory at some places like metro stations, school, colleges, petrol pumps, toll points, malls, airports, jewelers shop's ,etc.
5. Student should be responsible for adopting cashless payment modes and train own family for making cashless payment
6. All bank and digital apps should provide all detail either in compulsory language or local or regional language.
7. Government must introduce such system which keeps customer's data, safe and secure.
8. Digital payment companies should gives incentives like cash back or discount on cashless payment to encourage customers and benefits of these incentives transfer directly to customer's bank account.

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A Study on Technological Challenges Faced by SMEs in Biotech Sector

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Abstract

We are fortunate to be living in the Golden Age of Biotechnology. Though the bio-tech industry has traditionally been perceived as a high risk business and has faced unprecedented challenges, it holds the promise to solve some of the major problems being faced by mankind. There is little to doubt that Regenerative Medicine is one of the most exciting fields in the Health care domain of Biotechnology. RM promises to treat vast range of currently intractable clinical conditions, with newer applications being innovated all the time.

Keywords: Cost-benefit Analysis, Clinical adoption, Reimbursement

Introduction

Though the exact commercialized value of RM is hard to predict, conservative estimates (MARS 2008, Mason et al 2008, Devon Smith et al 2008) seem to suggest that it is already crossed the billion dollar mark.”

a) Manufacturing Challenges

- Interdisciplinary research capability
- Translation from lab to clinic, a formulation with clinical-grade reagents, implementing GMP.
- Product Design for Excellence in design and manufacture
- Batch sizes and scaling up/out of the process (choice of the facility)
- Sourcing key raw materials, contingency planning, and backup suppliers
- Reducing the incidence of batch failure
- Minimizing contamination (especially from autologous products)
- Managing clean room shutdowns and product supply

Discussion

As with any new biopharma venture, the first issue is GMP manufacture (Archer and Williams 2005) of a commercially viable product and in the case of RM the product should either target a hitherto incurable disease or vastly improve its current treatment. The interdisciplinary research team must first select a stem cell type and its appropriate sourcing. This is to be followed by cell processing in which the cell line must be screened and expanded while taking care to repress the biomarker. The production process must ensure reproducible culturing of suitably potent stem cells at a cost acceptable to the regulator. Kaizen or continuous improvement of the process is a must to get a quality controlled batch of cells that can be used for animal testing.

Once a CTC has been identified, it begins the arduous journey through the (Mason et al 2010) various phases of this translational cycle. The trouble is that the CTC may fail at any stage in its transition from Prototype design, through the various stages of its pre-clinical

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and clinical testing. The whole process may take years with billions of dollars spent, to emerge from an investigative new drug ready to face further safety trials. The highest failure rate is at this stage as the volume of basic science required is immense and the clinical trials expensive and time and resource-sapping. This has been identified as a Translational gap.

Translation is a fundamental issue and Hongsermeier 2005 points out that despite possessing interdisciplinary research capability, knowledge-bases will need to support caregiver and consumer-based decision support requirements. KM will play a critical role in translating research insights from the life sciences to clinical practice and vice versa and that market drivers will continue to make Knowledge Management an imperative for Translational Medicine. Genomics and personalized medicine will require decision support architectures that can proactively support complex decision making – answering thousands of decision support queries in a near real-time manner.

1.2.2.2 Quality

- Implementing a Total Quality Management System: Continuous improvement
- The insufficient (autologous) product is available for quality testing?
- Assay development (in-process and end-of-product)
- Validation issues (implementing DQ, IQ, OQ, PQ and process validation)
- Product specifications (incoming materials and release criteria, parametric release)
- Automation for reproducible results, controlled differentiation.

Discussion

The importance of process capability of an automated, scalable system as a platform suitable for the production of anchorage-dependent cells in sufficient volumes for regenerative medicine applications has been demonstrated amply in the study by (Liu and Williams 2010) The regulatory mechanism lays down the technical requirements to demonstrate the quality safety (Singh et al 2010) and efficacy as well as standards for donation procurement testing processing preservation storage distribution as well as the GMP and GCP, ethical compliances issues. the requirements for authorization product packaging and labeling combined with adverse reaction follow up and risk management system.

1.2.3. Clinical adoption

- Preparing clinical trial submissions
- Quantifiable endpoints
- Managing CRO's and their costs
- Meeting expectation with regard to recruitment rates
- Appropriate inclusion & exclusion criteria (and criteria shift)
- Selecting the best mix of physicians and convincing them.
- Post-trial surveillance and monitoring.
- Dose, potency, and route of administration.
- Managing complications or side effects

Discussion

The clinical conditions for the success of SMEs are (Singh and Williams 2008) related to the identification of a disease target and elucidating its pathophysiological profile, developing defined end points and obtaining initial success in animal models. Further, the human trials that follow must necessarily substantially prove that the intervention is symptom ameliorating and show beyond doubt that there is a functional improvement in

the specific disease stage without giving rise to any complications. The the remaining issue of administration is the determination of their type, dose and delivery methods followed by designing and executing clinical trials. This must be followed by post-trial surveillance to observe the long-term effect of the therapy

1.2.4. Commercial

- Evolve a strategy to mitigate risk
- Cost-benefit Analysis: efficacy studies
- Availability of initial funding and support from the govt.
- Keeping investors and other stakeholders satisfied
- A closer interface between Researcher, Manufacturer, and Regulator(Translational institutes)
- Modeling cost of goods and average selling price
- Identifying hidden costs (associated with quality testing, shipping etc.)
- Understanding reimbursement, forecasting of profits.
- Cold chain shipping of short shelf-life products
- Minimizing shipping delays (especially at customs)
- Shipping validation (ensuring product is viable on arrival at the clinic)
- Good Distribution Practice
- Maintaining sterility
- Finding the right partner/distributor.
- Trade associations to leverage strengths since this are a capital intensive, high-risk field.
- Clustering of the industry to reduce costs
- An ability to identify newly emerging opportunities, tap new markets, and technologies

Discussion

A fledgling RM SME is surrounded by a plethora of other issues, shrouded in uncertainty, that threaten to overwhelm it. Foremost among these issues is the prospect of seamless financing of its pressing capital requirement(Mcallister et al 2008) For start-up companies particularly in US a diversity of funding sources exist like university sponsored start-up funds, state grants and bonds, patient advocacy group, family foundations, angel donors venture capitalists DAPRA and other federal agencies and US Small Business Innovation Research (SBIR) and STTR)Small Business Technology Transfer exist that kindle partnership.

Clustering of SME, for easy access to technical advice, is a critical factor (success of Santiago and Bangalore based biotech clusters) for the industry to flourish. Clustering can also facilitate the formation of trade associations to leverage strengths since this is a capital intensive, high-risk field. Further a closer interface between Researcher, Manufacturer and Translational institutes is crucial and clustering can help in reducing costs, for example, ReNeuron that recently received approval for clinical trials for using neural stem cells for treating stroke victims (Sniden CEO Reneuron) points out that it is primarily a research-based organization and thus outsources manufacturing. .

An analysis of the failure of cell-based companies (Smith et al 2008, Johnson et al 2010,) can be a good indicator of the mistakes to be avoided by others. Inability to build a suitably innovative and profitable business model, for example, ATS and Organosynthesis cases show that having a clinically approved product alone does not guarantee commercial success. Products that offer scarce benefits over existing less expensive traditional

therapies can prove to be costly disasters, given the potentially disruptive nature of the product.

1.2.5 Reimbursement

- Classification of the product as Device or Drug?
- Substantially manipulated cell? Classify product as ATMP approach EMEA.
- Present data for proving quality, safety, and efficacy.
- No significant cell manipulation? Classify as Non ATMP.
- For subsequent manufacture storage and distribution approach MHRA.
- For obtaining a licence to ethically procure human cells approach HTA.
- The Gene Therapy Advisory Committee (GTAC) conducts clinical trials involving stem cells as well as that involving gene therapy.
- Multiple agencies No umbrella system- one size fits all model.
- Reimbursement model is based on incremental QALYs, willingness to pay (WTP) and Headroom analysis and return on investment analysis.

Discussion

Reimbursement decisions in healthcare systems with finite resources are increasingly influenced by formal health economic analysis (Cash et al 2007). It is therefore sensible for a company considering the development of a new medical technology to assess its potential cost-effectiveness as early as possible in the development cycle.

Cost-benefit Analysis

Return on investment may be affected by the prevalence of a disease, For instance, a disease that occurs only in very poor strata of the society may not be a good target for the Δ expensive RM option. Thus a cost-benefit analysis is based on the difference between the two, and a firm must aim to quantify the incremental cost-effectiveness ratio (ICER)

$$ICER = \Delta \text{Cost} / \Delta \text{QALY}$$

ICER is thus defined as the extra cost per unit of benefit when comparing two treatments.

The newly proposed RM option, versus the gold standard existing treatment for the specific condition.

The comparator should be the current gold standard for therapy for a specific condition, as only an improvement on this performance will support the reimbursement of a new technology.

QALYs are calculated as the sum of the product of the of the mean utility

The cost of health care is split between mixtures of private for-profit payer agencies.

The United Kingdom (UK)'s healthcare system is primarily public, with 80% of funding coming from taxation, 12% from national insurance, 4% from charges and miscellaneous, 3% from Trust interest receipts and 1% from capital receipts (European Observatory on Health Care Systems 2002). Approximately three-quarters of the UK National Health Service (NHS) budget goes to the Primary Care Trusts (PCTs), who are responsible for delivering health care and health improvements within a local area. PCTs are grouped into regional Strategic Health Authorities (SHAs); these groups help develop local NHS strategy and provide a link between PCTs and the national Department of Health. PCTs provide a range of community health services, including funding for general practitioners, medical prescriptions, and commissioning of the hospital and mental health services, as such they are considered key stakeholders in healthcare decision making. Value for money at the national level is commonly assessed through a process of Health Technology Assessment (HTA).

1.2.5 Research Gap:

The review of the literature shows that there is a growing realization that in the developed market growth is slow. The actual growth figures fall woefully short of the overhyped figures churned out by the overenthusiastic trade pundits (Lysaght et al 2003,2008) as the very large number of seemingly insurmountable challenges threaten to slow the growth of the RM industry in the developed world. (Mangematin et al 2003) emphasizes the need for geographic expansion to conquer new markets. Founded on the basis of a local or national market, firms with recognized competencies in a market niche can expand by conquering new markets, either in sectors neighboring those in which their competencies are recognized.

1.2.6 An ability to identify newly emerging opportunities, tap new markets, and technologies

For many SMEs, national frontiers still represent a significant barrier to expanding their business and they still depend largely, or solely, on their domestic markets. Current estimates indicate that only one-fifth of European SMEs have exports and only 3 % of SMEs have subsidiaries, branches or joint ventures abroad. Even more worryingly, internationalization is still not even considered by a substantial percentage of European SMEs despite the fact that SMEs are already exposed to strong international competition even within their own internal markets.

Studies have already demonstrated the direct link between internationalization and the increased performance of SMEs. Proactive internationalization reinforces growth, enhances competitiveness and supports the long-term sustainability of the company.

Despite its advantages, going abroad is still a big step for most small companies. They simply do not have the resources and the contacts which could alert them to suitable business opportunities, potential partners and openings in foreign markets. In addition, the financial investment needed to launch into the international arena can be a significant barrier to many SMEs. Also, the dynamic character of barriers means that difficulties will evolve with the degree of internationalization of the company.

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A Study on Reproductive Health among Tribal Women

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Abstract

The present study aimed to find the reproductive health among the tribal women. The study was carried out with 298 tribal women and they were selected through purposive sampling method from two tribal villages. The interview schedule made by the researcher was employed as the research instrument. The obtained data were analyzed using the required statistical tools. From the results, it was found that most of the tribal women were educated, having an occupation in agriculture with monthly income around Rs. 3000 to Rs. 6000. In regard to reproductive health care awareness and practices, most of the tribal women were poor in it. When the knowledge regard to the birth control and practices most of the tribal women were good in that. Thus the results show that the awareness of reproductive health among tribal women should be improvised.

Keywords: Health, Tribal Women, Reproductive Health, Health Care Practices.

Introduction

The concept of health differs from one society to other society. Every society has their own style of identifying, diagnosing and treating an illness. According to WHO, health is defined as 'a state of complete physical, mental and social well-being and not merely the absence of diseases or infirmity'. It is a state of dynamic equilibrium within us. Generally, good health is essential for all living being for its normal and essential functions. Only with healthy individuals a healthy society is possible which an essential aspect of a country is.

There is a chance for the health to get affected by various reasons like poor nutrition, hygiene, lack of awareness about the diseases, poor environment etc. This ill health condition may affect the individual in various aspects affecting their routine life. Ill health is a state of instability, failure of self-regulation, loss of function with oneself and the environment (Sonowal 2010). Being in ill health spoils an individual's productivity and efficiency.

The tribals are the group of people who usually live in remote areas like hilly and forest places and they often remain untouched and isolated by modern civilization and lacks the developmental processes that happening around them. Generally, the tribal health status in India is found to be poor and it seems to be affected by the general poverty, malnutrition, illiteracy, absence of sanitary living conditions, poor maternal and child health services which makes them be the vulnerable population' (Singh 2008).

Among the tribals, tribal women play a major role in shaping their society. Therefore their health is to be taken care much. The reproductive health of tribal women should be given utmost importance because; the future generation's health largely depends on it. If uncared, they are more prone to get reproductive health issues due to various factors.

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Reproductive health and its issues of tribal women are of great concern today. The care and need for such concern have raised due to the traditions and customs the tribal women carry out during childbearing. Most of the practices are found to create a danger to the health of women. One practice among them is limiting the food to get easy delivery, from the sixth month of pregnancy (Sonowal & Praharaj, 2007). Anemia is also another big health issue which is commonly seen among tribal women especially with pregnant women. It will reduce the developmental process of the fetus and leads to lot many issues like mental retardedness, and thus it will increase the mortality and morbidity among the tribal women (Singh 2008).

Maternal mortality is found to be more among tribal women due to their primitive practices and unhygienic practices. Along with these, they also lack in the intake of Tetanus Toxoid immunization, iron, folic acid tablets, and proper health supplements which will aggravate the health issue more. The unhygienic delivery practices during their delivery also play a major role in getting infections which affect both mother and the newborn. This infection might be another reason for the infant mortality too.

The health of the tribal women should be understood from the point of their culture, social, religion, geophysical environment, and economic conditions because they influence their health a lot. It is also known that there is a relationship between the health of people and the availability, effectiveness, accessibility of the health care facility and treatment. Thus in order to provide a good health to tribal women, all these factors should be considered. Since the reproductive health of tribal women is very important and an area to be explored more due to its importance, the present paper focused on to find a few important aspects related to their reproductive health.

Review of Related Literature

Geetha, Chenchuprasad, Sathyavathi, Reddy & Reddy (2015) aimed at studying the reproductive health status of Sugali women of the Rayalaseema region in Andhra Pradesh. 200 women in the age range of 15-45 years undergone an interview regard to their age at marriage, age at menarche, age at first conception, menstrual problems, mortality and fertility levels, the prevalence of diseases and women's perception towards their health. A cross-sectional design was carried out for the study. Sixty-five percent illiteracy was documented. Thirty-six percent of the women opined that their self-reported health was fair or poor. Illiterate women were 1.27 times at risk of developing menstrual irregularity than educated women. The risk was increased to 1.85 times when the spouse was illiterate too. Same results were obtained with menstrual problems and abortions. Overall it was inferred that Sugali women were subjected to significant reproductive health risks mediated by socio-economic conditions.

Nanda & Dhar (2017) examined the reproductive health of adolescent girls of Dongria Kondh tribe. The study area was to be Bissam Cuttack block and it was selected randomly. Ninety-three adolescent girls participated in the study. They completed the schedule of general information of the family, schedule cum questionnaire on KAP on reproductive health and lab investigation. The obtained results revealed that about 75% of adolescent girls had their regular menstruation. Dysmenorrhoea was present in 13% of girls. Most of the girls were having poor menstrual hygiene. 84% of adolescent girls knew about menstruation from their peer groups. About 61% of adolescents were not aware of physical changes in pregnancy. The study concluded that counseling for adolescent girls and their

mothers on sexual hygiene should be given and the health care delivery system to be strengthened by training and capacity building.

Objectives

1. To understand the socio-economic conditions of the respondents.
2. To find out the reproductive health care awareness and practices of the respondents.
3. To know the knowledge and practices of birth control methods of the respondents.

Methods and Materials

Total numbers of 298 female respondents within the age of 30 years from two tribal villages in Villupuram district were selected as sample. The purposive sampling method was adopted as a sampling method for collecting the data. The interview schedule designed and validated by the researcher was employed as the instrument for collecting the data.

Results and Discussions

TABLE NO-1: SOCIOECONOMIC CONDITIONS OF THE RESPONDENTS

Education		
Education of the Respondent	Frequency	Percent
Illiterate	102	34.0
Primary	70	23.3
High School	100	33.6
Higher Secondary	26	8.7
Total	298	100.0
Occupation		
Occupation of Respondent	Frequency	Percent
Agricultural Labors	106	35.6
Cultivator	103	34.6
Non - Farm Labors	22	7.4
Public Sector	36	12.1
Private Sector	31	10.4
Total	298	100.0
Individual Monthly Income		
Individual Monthly Income	Frequency	Percent
Rs. 3000 and below	78	26.2
Rs. 3001 –Rs. 6000	196	65.8
Above Rs.6000	24	8.1
Total	298	100.0

In the table, no 1 the education, occupation and monthly family income of the respondents are furnished. From the table it is found that 34% of respondents are illiterate, 23.3 % respondents completed their primary education, 33.6% of respondents completed their high school education and 8.7 % respondents have completed their higher secondary school education. Thus it implies that most of the respondents are literate.

With regard to the occupation, 35.6% respondents are agricultural labors, 34.6 % are cultivators, 7.4 % of respondents are non-farm labors, 12.1% works in the public sector and 10.4 % respondents work in the private sector. This infers that most of the respondents are in agriculture as labors and as cultivators.

When the individual's monthly income is examined 26.2% of the respondents earn Rs. 3000 and below, 65.8% earn up to Rs. 3001 to Rs. 6000, and 8.1% of respondents earn above 6000. This shows that most of the respondents have the monthly income within Rs. 3000 to Rs. 6000 range.

TABLE-2: REPRODUCTIVE HEALTH CARE AWARENESS AND PRACTICES OF THE RESPONDENTS

Number of Times prenatal checkups		
Number of Times prenatal checkups	Frequency	Percent
4 & above	298	100.0
Reason for a prenatal check-up	Frequency	Percent
Blood Pressure	5	1.7
Hemoglobin	34	11.4
Urine test for sugar and albumin	8	2.7
Weight	56	18.8
Scan test	195	65.4
Total	298	100.0
Nature of Health care during pregnancy		
Nature of Health care During pregnancy	Frequency	Percent
TT immunization first dose	97	32.6
TT immunization Second Dose	87	29.2
Iron and folic acid tablets	60	20.1
Health tonic and supplementary nutrition	54	18.1
Total	298	100.0

The details regarding to the reproductive health care awareness and practices are furnished in the table no 2. In regard to the number of prenatal checkups, it was found that 100% of respondents had checkups for four times and more during their pregnancy.

When the respondents were asked for the reason for their prenatal checkups 1.7% respondents replied that, the checkup was done to find their blood pressure level, 11.4% of respondents for knowing their hemoglobin level, 2.7% did to check their sugar and albumin level in urine, 18.8 % of respondents did to check their body weight and 65.4% of respondents carried out for scanning the fetus.

In regard to the health measure the respondents have taken during pregnancy, 32.6% respondents had their TT immunization dose 1, 29.2% respondents had their TT immunization dose 2, 20.1 % respondents had taken iron and folic acid tablets and 18.1% respondents had health tonic and other supplementary nutrition.

TABLE-3: BIRTH CONTROL KNOWLEDGE AND PRACTICES OF THE RESPONDENTS

Do you know birth control is essential to limit the family size?		
Do you know birth control is essential to limit the family size	Frequency	Percent
Yes	298	100.0
What are the advantages of birth control?		
What are the advantages of birth control	Frequency	Percent
Less family burden	113	37.9
More comfort	150	50.3
Less population burden to the country	5	1.7
Less expenditure and more money saving	30	10.1
Total	298	100.0
Family Planning Done		
Family Planning is done	Frequency	Percent
Yes	298	100.0

The details with regard to the knowledge and birth control practices are furnished in the table no 3. From the table, it is found that 100% of respondents were having awareness in regard to the birth control measures to limit the family size.

When the respondents were asked for the advantages of birth control, 37.9% respondents replied that birth control is essential for reducing the family burden, 50.3% responded that birth control is essential for more comfort of the family, 1.7% responded as to reduce burden to the country and 10.1% responded that birth control is needed to for economical comfort, it is for less expenditure and more money saving.

It was also found that 100% of respondents have done their family planning.

Summary and Conclusions

The present study explored the reproductive health among tribal women in Villupuram district in Tamilnadu. The study is carried out with 298 tribal women, using purposive sampling technique. The instruments devised by the researcher were employed to collect the data. From the results it is found that the majority of the tribal women are found to be educated, having their occupation in agriculture and most of their earning is around Rs. 3001 to Rs. 6000 per month. Thus in regard to socio-economic condition, the illiterate tribal women found should be educated and also steps should be taken to bring awareness to them regard to various other occupations and the ways to earn better.

In regard to the reproductive health care awareness and practices of the respondents, it is found that all the tribal women participated in the study has taken their prenatal checkups four times and above. So with this, it could be understood that the tribal women are having good awareness in regard to the importance of prenatal checkups. It is also found that most of the women did prenatal check for scanning fetus, and few others for checking their body weight, sugar and albumin level in the urine, hemoglobin level and for checking their blood pressure. This implies that most of them are aware of doing a scan but not for the hemoglobin, blood pressure, sugar, albumin level, and body weight. Therefore the importance of doing checkups for these should be taught to them. When the nature of

health care measures during pregnancy it is found that only less number of women had taken TT immunization for 1st dose and the number reduced for taking the 2nd dose. Thus it could be inferred that there is a lack of awareness about the TT immunization and hence it should be taught. It is also found that less number of tribal women only took the iron, folic acid tablets, health tonic and required supplementary nutrition. Thus again it is found there is a lack in the intake of the iron, folic acid tablets and required supplementary nutrition. Thus it is highly needed to make them aware of these.

When the knowledge about birth control and its practices assessed, it is found that all the respondents are highly aware, that birth control is essential to limit the family size. When advantages of birth control are examined, it is found that most of the women found birth control helps to reduce family burden and to have more comfort in the family. Few responded that family planning is advantageous because less expenditure will happen for children and thus more money could be saved. According to a few respondents, birth control helps to lessen the population burden to the country. Thus it is found that the tribal women are found have good awareness about the birth control and its practices.

Overall, it could be stated that steps should be taken to improve the economic condition through various means. Proper awareness about the reproductive health its practices and about birth control and its practices should be given to the required tribal women.

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Issues and Challenges of Higher Education in India

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Abstract

Higher education in India contributes towards building immense future of students. It is essential for the students to enter in the education sector or in professional sector for employment. But output of higher education in India is not satisfactory because system is facing many challenges in terms of faculty, research, student enrolment ratio, international student mobility, access and equity, inclusion, curriculum designed and quality of education etc. There is a strong need felt for the development of higher education so as to compete with the international standard of education. The government has announced new education policy which aims at expanding the access and bridging the gender gaps and provides the world class infrastructure for realising the human resource potential in full. Therefore, this paper attempts to analyse issues and challenges of higher education in India.

Introduction

The main aim of education depends on one's philosophy i.e. what we think about our student's life. Education is not only meant for development of mind but it also aims to develop body and intellectual spirit. Higher education in India is not merely teaching to the diploma, undergraduate, post graduate or PhD students but it includes generation of new knowledge through new courses offered, new curriculum designed for the relevant subjects, through the use of good quality infrastructure and through improved research facilities in universities, colleges or institutions. Obtaining Degree for Higher education in India for all is must in order to improve the wealth of our nation, i.e. human resource. It is immaterial whether student belongs to minority group, unreserved or reserved category. Education is for all i.e. for physically challenged person or an adult. When there are so many reasons (let us say – financial background is not strong, male dominated society or lack of interest etc.) to avoid the education after schooling, it is not only a bane for that poor student but a strong blot on the nation. Actually speaking, whether government initiated so many efforts at its highest level to enrich the education system but it is not advantageous till everybody changes his/her mindset towards the education. Problems are inherent in everybody's life. The need is to cope with it, and in fact the aim of education should be to give the students a practical exposure to the life along with the teaching. Therefore, this paper attempts to examine issues and challenges of higher education in India.

Objective of the Study

This paper is aimed at getting indepth sight over the issues and challenges of higher education in India at Government level, institutional level and teacher level. At the end, study is focussed at providing some concrete suggestions to improve higher education system in India.

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Issues and Challenges at the Government Level

- **Global Oriented Approach** -The first problem that rests with the government that it undertakes lagging approach not a leading approach towards making Indian student a global one. Although Indian government has made concrete efforts to make Indian student capable of being global through offering various skill based courses, diploma and online courses, yet the efforts remain nonetheless. The Indian students are not able to cope with foreign students in general. The fact is that the government is still trying to match the education level of rural masses with the urban masses. To make a student global one is a very challenging task yet not impossible. As we know that more than 60% of our population is youth i.e. below the age of 30. So skill development of the students has to be enhanced so as to make each youth in India capable. Though the Government has opened so many universities, colleges and standalone institutions, having a long list of courses under the private aided and unaided programs and so on, yet the pupil teacher ratio, infrastructure, dropout ratio, gross enrolment ratio, education development index has been very low and poor. These are no doubt of a great concern for the government but the solution lies always at the gross root level.
- **Language problem-** There is no uniform language being used in each part of the country. Most of the states are facing various problems in this regard. Though most of the Indian teachers use either regional language or English language while teaching, yet national language Hindi is not been given due importance in each and every state. It is very unlikely that other economies of the world use their mother tongue in teaching and research, and Indian government can not generalise to use Hindi language along with use of other regional languages. Government has considered one thing very well that teaching is an art as well as science. It is purposeful activity. In Uttarakhand, there is no uniformity in the language used in different areas. In Kerala, Malayalam is the mothertongue language but the books are not available in Malayalam. Therefore, the concern is to adopt a uniform language in each state as well intrastate of the nation.
- **Public-Private Partnership-** Indian government has adopted Public-Private Partnership Model in Higher education which is very troublesome concern for State Public Universities, government colleges and government aided institutions in India. The existence of these higher education institutions is wholly dependent upon the students but when privatisation enters in any area then it works as a double-edged weapon. No doubt Privatisation brings very fruitful results for the government as well but the apathy for future of students is not taken into consideration. High Cost of education in these institutions can not be met by all India students. Therefore, this is not only creating indifference in the education structure but this system is responsible for unequal distribution of human resource in educational institutions.
- **High Corruption-** Indian bureaucrats have a big hand in granting aid to educational institutions. Recently, it was announced that Higher Education Commission of India (HECI) will be in force in place of University Grants Commission. HECI will be governed by officials of Human Resource Development Department of India. This initiative has created a big question mark on the government mechanism and working for the development of higher education in India.

Issues and Challenges at Institutional Level

- **No Quality Assurance-** Some quality issues are still persistent in Higher Educational Institutions (HEI) in India. There is not enough time to devote towards quality issues

rather than focus is on more and more intake of students. The emphasis is generally towards increase in gross enrolment ratio. The government is also taking response over how many students are taking higher studies but the more prominent question in today era is to find out quality education and provide it with equity, access and inclusion of all. In HEIs, no quality time for quality researches particularly in the case of colleges. In universities, the scope of quality research is more in comparison to government and government aided colleges.

- **Political Interference-** HEI authorities also suffer political interference to the extent through which their institutions get some kind of grant, aid or relief by the political party. But it is extremely bad for the students, society and the nation. Because political parties interference in HEIs itself indicates that education and employment both are depending upon some bureaucrats rather on the skill, knowledge and awareness of students.
- **Autonomy Problems-** In HEIs, there is no provision of full autonomy to government aided colleges. The autonomy in higher education is subject to various considerations in mind. On the one hand, full autonomy to HEIs will make these institutions exploitative in the sense that the full time regular teachers will not be employed as government interference will be nil. On the other hand it is good as HEIs have not to wait for lengthy process of recruitment of teachers, not to wait for the NO-Objection Certificates and moreover, political interference will get reduced.
- **No uniformity in syllabus-** there is no particular uniformity in syllabus of different universities of India be it graduation, post graduation or other courses. For example, Choice based Credit System (CBCS) is used in kurukshetra university of Haryana but affiliated colleges of this university do not follow this CBCS system. On this basis, the outgoing students of colleges and university are very much different in their arena of knowledge and therefore placement differs.
- **Corruption-** No educational institution is left behind from the patch of corrupted officials. Maharashtra and karnatka have the sole distinction of corrupting the education system. Corruption in India at the grass root level is very high and common. Department of Higher Education is also following this trend. Either it is recruitment process or the promotion case, corruption is rooting itself deep more and more. HEIs are not much kept apart from this corruption problem by bureaucrats of the nation.
- **Quality issues of Private HEIs** – There are some common problems of HEIs in each part of the country. Government has given No Objection Certificate too many private educational institutions but did not bother about quality issues of education. In these private educational institutions, teacher-student ratio is very low which unduly pressures them to adopt the rule of minimum cost and maximum profit which in turn make it impossible to survive for long term for these private institutions.

Issues and Challenges at Teacher Level

HEIs now-a-days are facing problem of low gross enrolment ratio. The reasons are being attributed to poor teaching only. So the foremost problems of all the teachers begin here:

- **Administration Problems-** In today's time, teacher's work is not restricted to teaching only rather they have to concentrate more on administration work along with their daily teaching which eventually impacting upon the quality of teaching. Even, the government is taking administrative responsibilities as one of the criterion for career

advancement, so it has becoming need of every teacher to do more administrative work rather than to concentrate more on how to improve research.

- **More workload-** As per UGC guidelines, the teacher's workload has been determined but at the institutional level, it is being considered as the minimum workload and they are being assigned more classes. Again the administrative pressure makes teachers burdensome with more teaching and administrative work and there is no much time left for research.
- **Alternatives of Teachers-** The students are having many options of learning now. The face to face teaching has many advantages as it involves two way communication but the government is more focussing on the usage of recorded tutorials through EDUSAT programme, live lectures, online courses etc. it is merely targeting good quality teachers who devote their precious time in getting good education and placement but their alternative is more preferred by the institutions and the government itself.
- **Student feedback-** the institutions are giving due importance to students and more rely upon the feedback given by the students related to college administration, teaching-learning process. This system is giving more value and weightage to students thereby students have started taking teachers non-serious. It means moral values are declining and even the teachers are being killed by students for just giving bad score in exams or little issues like Parents-teacher meet etc.
- **No healthy work environment-** HEIs are aimed at social welfare and teachers being human are the part of society. They are generators of knowledge and future maker of students but what is happening today is the most critical for a teacher-be it recruitment, selection, transfer or promotion teachers have to face lots of problems. Even doing their good job, they are not credited with outstanding performance on their part because of so called politics in each institution. Instead of creating good and healthy work culture, problems are being created so as to make teachers more stressful. The consequence is on personal as well as on academic achievements.

Suggestions

Education is a social and purposeful activity. To stop becoming education a business the following suggestions are being provided here:

1. Malicious political interference should be stopped. For that healthy student and teacher unions are required.
2. Student Charter must be prepared so as to save students from malpractices adopted by HEIs.
3. Education must include teaching of moral values at each standard of higher education.
4. There is no need to make it mandatory to adopt ICT while teaching. The GURU is need of the hour now. GURU can only bring students from darkness to light.
5. Employability Gap in higher education should be removed as far as possible so as to make Indian students global one.
6. Beginning from contribution to teaching, administration, extracurricular, co-curricular and research, quality issues must be considered well in advance by the administrators.
7. Good teacher-taught relationships, student discipline must be preserved.
8. Democratic rights of students should be protected so as not to make them criminals.
9. Lack of good infrastructure at institutional level for doing quality research is the main concern of teachers. It must be given priority by the administration so as to compete with foreign educational institutions.

10. Political parties should be debarred from interfering in decision making of universities and HEIs so as to remove high rate of corruption.
11. There must be skill development of teachers as well as of students but the pressure of using live lectures, EDUSAT and other ICT tools while teaching should not be there so as to create healthy environment.
12. Issues of Autonomy in Higher education should be strictly understood before getting it implemented.

Scope for further Research

This paper has studied in detail few of issues and challenges of higher education in India. Few more issues like gender sensitisation in higher education, quality issues in higher education, employability issues concerned with higher education can be studied in detail for further inferences. State wise analysis can be done. This paper is descriptive one. An analytical study of each issue can be done.

Conclusion

This paper concluded that there are numerous problems at each end-be it government, HEIs, teachers or the students. But the solution lies in one thing only that Higher Education must be made student oriented only and only rather than system oriented. There is strong need of good leaders like Moraraji Desai and Lal Bahadur Shastri to make Higher education of India leading one in each corner of the world. GURU is the prime requirement of the nation. All other issues like access, equity, inclusion etc. are equally important but problem at grass root level must be sorted out. At the end, it can be said that all the challenges of Higher Education in India can be easily met with healthy teaching environment and fair system.

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Educational Development Consequent upon Education Expenditure in India and Tamil Nadu State

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Abstract

The study of trends in education expenditure and its consequence on education development is an important matter of subject discussion. This paper makes a macro analysis on growth of gross domestic product, growth of number of recognized educational institutions in India, growth of students in primary level education, growth of students in upper primary level education, growth of students in secondary and post secondary level education and growth of students in higher education. In this paper correlation between expenditure on education and growth of educational institutions and students enrolments in various level of education are discussed. Further, in paper a comparative analysis of education expenditure and physical achievement in various levels of education between India and Tamil Nadu has been discussed. Table-1 presents data on the growth of expenditure on education and gross domestic product in India during the period 1951-1952 to 2014-2015. The GDP of India was Rs. 10080 crore in 1951-1952 and it increased to Rs. 12433749 crore in 2014-2015. This level of increase in GDP shows an 11.57 per cent annual compound growth. The growth rate explains the 89.55 per cent fluctuation as per the result of coefficient of variation analysis. This level variation is due to slow growth rate of a GDP during the period 1951-1952 to 1990-1991. The GDP growth rate became rapid during the period 2009-2010 to 2014-2015. The correlation between growth of Indian government expenditure on higher education and growth of higher education is statistically significant at the national level and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on higher education and students' enrolment in higher education is not significant at the Tamil Nadu state level. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

Keyword: Higher Education, GDP, Student's Growth Rate,

Introduction

The study of economics of education is very important and education is an important input in human resource development. According to Woessman (2015), education is a major determinant of economic growth, in terms of knowledge generation, employment generation and income generation. The absence of education may result in differentiation in knowledge generation and future generation prosperity would be deteriorated in terms of occurrence of poverty, lack of assurance about social security and social exclusion. UNESCO (2012) ii brings to focus that spending USD on education may generate income in the range of 10-15 USD per capita per day. Thus the role of education in economic development is well established. The role of education in economic development could be

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observed that education can bring collective workforce towards production of goods and services. As per the report by Barro and Lee (2010) iii the secondary and tertiary education can facilitate the process of knowledge transfer with respect to development of new ideas, production process and techniques and knowhow. It is evident that human capital formation is very essential in economic development. In turn human capital formation depends on education. World Economic Forum (2016) iv points out that education generates the stock of skills, capabilities competencies and productivity enhancing qualities. Thus the economic production of goods and services depends on education. The importance of education can be traced that it empowers the people, reduces the corruption and improve the capacity of the governance. The educational attainment can be considered in terms of quality and merely on completion of number of individuals with primary education. The quality of education should not be merely based on completion of schooling in terms of completion of primary education secondary education or higher education Educational attainment should develop individuals with appropriate human resource potential. Despite effective emphasis on education in sustainable development goals nearly 103 million youth throughout the world remain illiterate mainly among women as per the report by UNESCO. The relationship between education and economic growth is an important matter of subject discussion. In this connection, Hanushek, E. A., and Woessmann, L. (2012) v brings to focus on relation between cognitive skills of the population consequent upon education attainment and long run economic growth of any country. It is clear that mere educational attainment in terms of number of years of schooling is sufficient to develop human resources and it should be based on the skill development. The human capital generation and utilization depends of attainment of school education in general and higher education in particular. Hanushek, et al., (2010) vi argued that developing countries have made a considerable progress in narrowing down the gap with developed countries in terms of school educational attainment. An analysis of economics of education is very important. The expenditure on education is a yardstick to assess the performance of education. As per the report by IIASA (2008) educational attainment determines the survival rates of the individuals, decline in fertility level and enhancement in the quality of governance. UNESCO (2010) notes that elementary education is necessary towards, health promotion and enhancement in living conditions. However, the achievement of millennium development goals depends on secondary education. It is observed that life of the African 1-8 million children could have saved if their mother had at least secondary level education. UNESCO (2010) brings to focus on importance of secondary education among women towards maternity and child care practices, access to health institutions, taking effective medical care, reduction in maternal mortality and properly educating their children. The influence of primary education in workforce effective participation is well established. As per the report by UNESCO (2010a) primary educational attainment has brought positive economic effects in agriculture during the past 40 years. In this connection, Hanushek et.al. (2017) made a comparison of 15 countries with respect to impact of primary educational attainment on earnings of an individual. It is proved that 10 per cent increase in an average person's earnings results in 0.37 per cent GDP increase. Further, Psacharopoulos and Patrigo (2004) xii report that on the basis of a case study, additional educational attainment increased 10 percent earning on the part of the individuals. As per the report by UNESCO (2010) the developing countries investment in primary education is higher than the

developed countries. However, the developed countries investment on higher education is higher than the developing countries. It is significant to note that government expenditure on basic education is very essential towards eradication of hunger and poverty. The importance of primary education in economic production has brought out the attention of many scholars. Lockhead, Jamison and Lau (1980) made an analysis of impact of primary education on agricultural development in 13 countries. The authors observed 8.7 per cent increase in agricultural production consequent upon 4 years of schooling. Muro and Burchi (2007) conducted a study in 48 countries with reference to primary education and food insecurity. The enhancement in primary education reduced the food insecurity in the rank of 20 to 24 per cent. The educational attainment has considerably reduced the incidence of poverty. In this connection UNDP (2010) reported that poor people constituted a more in hungry in households without education. The long term economic growth depends on expansion of education, provision of wide access to the learning opportunities

The investment in secondary education is important to accelerate the process of economic development. The importance in expansion of secondary education is well recognized in United Nations' Millennium development goals and achievement of educational target by 2030 in terms of achievement of primary and secondary education for all boys and girls. In order to accelerate the expansion of secondary education many attempts have been made by developing countries. As per the report by UNESCO (2015) 94 low and middle income countries made provision of lower secondary education at free of cost. Many research studies have been conducted to reflect the impact of secondary educational attainment on economic development. The importance of secondary education can be observed from the findings of many research studies. IIASA (2008) reported that presence of variation in the impact of educational attainment on economic growth among nations, gender and ethnic groups. UNESCO (2012) brings to attention on effect of secondary education earning capacity of the individuals. The secondary level educated persons earn higher income than the primary level educated persons and a considerable number of women crossed over poverty level consequent upon attainment of secondary level education.

The role of higher education in economic development is well established. In this connection, Power et. al., (2015), point out the relationship between educational attainment and economic growth. According to the authors, the social and private rate of return on investment is higher in primary education, followed by secondary education and higher education. The importance of higher education has been realized that it produces both social and private benefits.

The human resource development depends on expansion in educational opportunities and access to such opportunities. The educational attainment develops communication skills, better decision making capacity and participation in political affairs. Further educational attainment enables one to take socially relevant innovation required for economic development. The enhancement in human potential consequent upon educational attainment should create an effective human resource potential in production of goods and services.

It could be noted that investment in education creates individuals with access to opportunities towards utilization of technical know now. The educational attainment enables individuals to easily adopt the foreign technology along with acquisition of appropriate skills in utilization of foreign technology in the direction of production of goods and services. According to Jones technology improvement is considered as engine

of economic growth. The foreign technology adoption depends on effective maintenance of human capital.

There is a close relationship between health and education. The educated people are aware of all sorts of health care opportunities and how to make use of such opportunities in healing their illness. Maintenance of good health is an indicator of perfect utilization of human resource potential. Schultz (1961) argues that poor health status among population is a negative sign of effective human resource development. In order to promote health, many health care programmes have been implemented in all the countries including India. Maintenance of health quality enables to create effective human resource potential.

Review of Literature

Verma, Chaman (2017) had made an analysis of development status of higher education in Northern India. The author made a comparative analysis of higher educational development in Haryana and Punjab and pointed out the importance of government policies on privatization in developing a large number of higher educational institutions. Further higher educational institutional development has been observed in engineering. It and other technical fields consequent upon government support in developing education in these fields as per the report by the author.

Camilleri, Mark A. and Camilleri, Adriana (2016) had made an analysis of role of education in promoting social cohesion in Malta. The authors identified the need for better policies in promotion of economic growth consequent upon educational attainment. The educational development depends on access to schools, flexible working hours and teacher incentives. In conclusion, the researchers urged the need to improve the education leadership towards increasing educational standard, economic productivity and economic growth.

Botlhale, Emmanuel (2015) had conducted a study on financing higher education in Botswana. The authors identified the problems in financial higher education and Botswana and suggested the alternative mode of financing to overcome the problems in the current system of financing higher education. State Council of Higher Education for Virginia (2010) made an assessment of status of international education programs of common wealth. It pointed out the link between international higher education programmes and economic development and trend in globalization of higher education on economy of Virginia and suggested measures to enhance the higher education in Virginia.

Gaba, Ashok K. and Li, Wei (2015) had made an analysis of growth and development of distance education in India and China. The authors made a comparison by taking indicators on development of economy and development of distance education in two countries with reference to course design, development of delivery mechanism in two major universities, Indira Gandhi National Open University of India and Open University of China. Further in students' enrolment in these two universities and recognition level are highlighted by the author. The authors identified the variation between India and China in provision of distance educational programmes.

Halaisz, Gaibor (2015) had identified the role of education in social transformation in Central and Eastern Europe in 2004. The authors brought to focus on educational objectives of the countries with social economic achievement targets, role of European Union Policy in strengthening linkage between education and socio economic development and impact of national educational reform on social transformation in the selected countries.

Udefuna, Patrick Nnadozie, Akalefu, Chiedo and Asogwa, Chinako (2013) had conducted a study on role of entrepreneurship education in economic development in Nigeria. The authors found out that the decline in quality of education, increase in the incidence of under employment and stagnation of national economic development. Hence, there is need to restructure entrepreneurial education system towards job creation in Nigeria as per the report by the researchers.

Tilak, Jandhyala B. G (2010) made an analysis of higher education, poverty and economic development across the countries. The author made use of indicators on infant mortality, life expectancy and economic growth to analyze the link between higher education and economic growth among developing countries and developed countries. The authors concluded that higher education plays a significant role in economic development of the examined countries.

Kozma, Robert B (2011) had made an analysis of the US National Educational Plan Technology. The authors made use of macroeconomic research, micro economic research, labour market studies and work force studies towards analyzing the economic link with educational transformation.

Objectives

1. To study the macro level trends in educational expenditure and education development in India.
2. To analyze the pattern and diversification and trends in development of higher education in India and Tamil Nadu.

Hypotheses

1. There is a significant correlation between educational expenditure and growth of educational institutions and student's enrolment in India during the period 1950-51 to 2014-2015.

Methodology

The study employs only secondary data. There is no concern about the sampling method and procedure. However, in this study, Indian educational scenario has been analyzed with Tamil Nadu state. The selection of Tamil Nadu is left with the following facts. It could be noted that though Tamil Nadu lags behind Kerala state in terms of literacy, but Tamil Nadu has well developed in higher educational infrastructural facilities and also students' enrolment. This study employs only secondary data. The relevant secondary data are collected from the various statistical reports of Ministry of human resource development, government of India. Such as Statistics of Higher and Technical Education, Analysis of Budgeted Expenditure on Education, All India Survey on Higher Education, Educational Statistics At a Glance and Annual Status of Higher Education of States and UTS In India. The collected data are classified and tabulated with the help of application of appropriate statistical tools, cross tabulation has been made on the basis of putting time duration period as independent variable and indicators on educational expenditure, students' enrolment in various levels of education growth of educational institutions, diversification of higher education, community groups participation in higher education, minority groups participation in higher education and people with disability participation in higher education.

Analysis and Discussions**Table-1: Public Expenditure on Education and Gross Domestic Product (GDP)
(Rs in Crore)**

Year	GDP at Current price (at Factor cost) (Rs. crore)	Total Expenditure on Education by Education & other Departments (Rs. crore)	Expenditure on Education by Education & other Departments as % of GDP
1951-52	10080	64.46	0.64
1960-61	16220	239.55	1.48
1970-71	42222	892.36	2.11
1980-81	130178	3884.20	2.98
1990-91	510964	19615.85	3.84
2000-2001	1991982	82486.48	4.14
2005-2006	3390503	113228.71	3.34
2006-2007	3953276	137383.99	3.48
2007-2008	4582086	155797.27	3.40
2008-2009	5303567	189068.84	3.56
2009-2010	6108903	241256.02	3.95
2010-2011	7248860	293478.23	4.05
2011-2012	8736039	333930.38	3.82
2012-2013*	9946636	368132.87	3.70
2013-14(RE)*	11236635	433640.59	3.86
2014-15(BE)*	12433749	502929.34	4.04
CV	89.55	92.46	30.83
Annual compound growth rate	11.57	14.78	2.88

RE Revised Estimate

BE Budget Estimate

Data Source Ministry of Human Resource Development, Government of India

* Base year has been revised from 2004-05 to 2011-12

The total expenditure on education was Rs. 64.46 crore in 1951-1952 and it rapidly moved to Rs. 502929.34crore in 2014-2015. It could be seen clearly from the above table that the though the share of educational expenditure growth rate is low, the growth of aggregate expenditure on education is higher during the period 1951-1952 to 2014-2015 in India. It is significant to note that the Indian GDP expenditure on education and share of educational expenditure was low during the period 1951-1952 to 1990-1991. In India the increase in GDP educational expenditure and increase in share of education expenditure has been observed during the post reform period from 1990-1991 to 2014-2015 consequent up on economic reforms, along with expansion of educational opportunities and implementation of new educational schemes such as educational for all schemes and right to education act.

Table-2: Growth of Number of Recognized Educational Institutions in India

Level/Year	(in hundred)			(in absolute number)	
	Primary	Upper Primary	Senior Secondary	College	University
1950-1951	2097	136	74	578	27
1960-1961	3304	497	173	1819	45
1970-1971	4084	906	371	3277	82
1980-1981	4945	1186	516	6963	110
1990-1991	5609	1515	798	5748	184
2000-2001	6387	2063	1261	10152	254
2005-2006	7726	2885	1596	16982	350
2006-2007	7849	3056	1696	19812	371
2007-2008	7878	3252	1730	23099	406
2008-2009	7788	3656	1863	27882	440
2009-2010	8199	3941	1939	25938	436
2010-2011	7485	4476	2032	32974	621
2011-2012	7143	4788	2124	34852	642
2012-2013*	8539	5778	3413	35525	667
2013-2014*	8589	4215	2371	36634	723
2014-2015*	8471	4251	2446	38498	760
2015-2016*	8405	4296	2521	39071	799
CV	29.90	55.66	58.90	66.43	64.31
Annual Compound Growth rate	2.16	5.46	5.58	6.7	5.35

NA Not Available

Note from 1950-51 to 1990-91, figures for Senior Secondary include the number of secondary Institutions too.

Data Source

Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures related to School Education are provisional.

A keen observation of data in table-2 indicates the growth of number of recognized educational institutions in India. It could be seen clearly from the above table that in India the growth of colleges ranks the first position during the period 1950-1951 to 2015-2016, growth of secondary and post secondary schools the second, growth of upper primary schools the third, growth of universities the fourth and the growth of primary schools the last. In absolute number the primary schools constitute first rank, upper primary schools the second, secondary and post secondary schools the third, colleges the fourth and universities the last. The growth rate fluctuation is low in primary schools and it is above 60 per cent in the case of growth of colleges and universities in India during the period 1950-1951 to 2015-2016. The high level increase in educational institutions in India is attributed to the enhancement in educational expenditure in India during the period 1951-1952 to 2015-2016.

Table-3: Growth of Students Enrolment in Primary Level Education

(In lakh)

Level/Year	Primary		
	Male	Female	Total
1950-51	138	54	192
1960-61	236	114	350
1970-71	357	213	570
1980-81	453	285	738
2000-2001	640	498	1138
2005-2006	705	616	1321
2006-2007	711	626	1337
2007-2008	711	644	1355
2008-2009	706	647	1353
2009-2010	697	639	1336
2010-2011	701	646	1347
2011-2012	726	672	1398
2012-2013*	696	652	1348
2013-2014*	686	638	1324
2014-2015*	676	629	1305
2015-2016*	669	622	1291
CV	31.85	41.87	36.37
Annual compound growth rate	2.46	3.83	2.98

NA Not Available

Note from 1950-51 to 1980-81, figures for Class XI-XII include Class IX-X

Data Source Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures are provisional

A keen observation of data in table-3 indicates the growth of students in primary level education. It could be seen clearly from the above table that the growth of female students' enrolment in primary level education is faster than the male students' enrolment during the period 1950-1951 to 2015-2016. However in absolute number male students' enrolment in primary level education is higher than the female students. The growth rate fluctuation is found to be high among the female students' enrolment in primary level education during the period 1950-1951 to 2015-2016. The increase in female students' enrolment in primary level education in India is due to government policies put much emphasis on educating female children in the country through introduction of attractive schemes such as education for all schemes and right to education act.

**Table-4: Growth of Students Enrolment in Upper Primary Level Education
(In lakh)**

Level/Year	Upper Primary		
	Male	Female	Total
1950-51	26	5	31
1960-61	51	16	67
1970-71	94	39	133
1980-81	139	68	207
2000-2001	253	175	428
2005-2006	289	233	522
2006-2007	299	246	545
2007-2008	311	262	573
2008-2009	314	270	584
2009-2010	317	278	595
2010-2011	327	292	619
2011-2012	331	299	630
2012-2013*	333	317	650
2013-2014*	341	323	664
2014-2015*	345	327	672
2015-2016*	347	329	676
CV	43.50	54.27	48.28
Annual compound growth rate	4.07	6.65	4.86

NA Not Available

Note from 1950-51 to 1980-81, figures for Class XI-XII include Class IX-X

Data Source Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures are provisional

A keen observation of data in table-4 indicates the growth of students in upper primary level education. It could be seen clearly from the above discussion that the growth of female students' enrolment in upper primary level education is faster than the male students' enrolment in upper primary level education during the period 1950-1951 to 2015-2016. However in absolute number male students' enrolment in upper primary level education is higher than the female students. The growth rate fluctuation is found to be high among the female students' enrolment in upper primary level education than the male students during the period 1950-1951 to 2015-2016. The increase in female students' enrolment in recent years is due to realization of importance of educating female children on the part of the families in general and introduction of attractive government schemes in particular.

Table-5: Growth of Expenditure on Elementary Education in India and Tamil Nadu

Year	Total Expenditure on Elementary Education					
	India			Tamil Nadu		
	Expenditure	Elementary Schools	Students enrolment	Expenditure	Elementary Schools	Students enrolment
2004-2005	419383010	1124033	168283332	18890909	50436	6831343
2005-2006	513198229	1196663	179342817	20045425	52423	9776589
2006-2007	603418857	1250775	185043293	26148604	53307	9842753
2007-2008	6872093612	1285576	18772713	28872190	53890	9878321
2008-2009	859805753	1303812	187872926	39432923	54428	9924561
2009-2010	1004987602	1362324	193051999	46086642	55175	9797264
2010-2011	1231145715	1412178	199055130	55562376	55175	9776252
2011-2012	1420241588	1431702	199710349	64827512	56535	9678476
2012-2013	1531449890	1448712	198899659	66706571	56535	9396443
2013-2014	1747872797	1445807	197666909	76117700	57153	9252467
2014-2015	2124867758	1445807	196716511	82995761	56785	9236192
CV	108.51	8.45	30.14	47.96	3.82	9.44
Correlation		0.89	0.33		0.18	0.49
Annual Compound Growth rate	15.9	2.31	1.43	14.4	1.08	2.78

NA Not Available

Note from 1950-51 to 1980-81, figures for Class XI-XII include Class IX-X

Data Source Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures are provisional

A table-5 presents data on the expenditure on elementary education and growth of elementary education in India and Tamil Nadu. It could be seen clearly from the above discussion that growth of government expenditure on elementary education is greater at the all India level than the Tamil Nadu state level during the period 2004-2005 to 2014-2015. Similarly the growth of elementary schools, but the growth of students' enrolment in elementary level education is higher in Tamil Nadu than the all India level. The correlation between growth of Indian government expenditure on elementary education and growth of elementary education is statistically significant and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on elementary education and students' enrolment in elementary level education is not significant. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

Table-6: Growth of Secondary and Post Secondary Education Expenditure and Growth of Secondary and Post Secondary Education in India and Tamil Nadu

Year	India			Tamil Nadu		
	Expenditure	Secondary Schools	Students enrolment	Expenditure	Secondary Schools	Students enrolment
	2004-2005	253253060	168565	13833456	17662051	7566
2005-2006	287148144	168725	13942065	20201779	7642	1150626
2006-2007	321359014	169568	14040408	23086023	7833	1152073
2007-2008	337068502	172990	16257779	271219198	7572	1255511
2008-2009	476088116	186310	16890633	36041820	9604	1109735
2009-2010	601940574	193888	17758354	44747225	12996	1168438
2010-2011	759266187	206483	54701288	56719176	10186	3811563
2011-2012	871566868	212454	21007565	63179786	19430	1184232
2012-2013	1027862272	228914	54563885	69206393	11581	3842440
2013-2014	1075707876	237111	59610997	76674245	11587	3968699
2014-2015	1216856751	244653	61803397	89672971	12297	3941483
CV	53.45	14.42	67.36	101.58	32.77	64.30
Correlation		0.87	0.89		0.06	0.15
Annual Compound Growth rate	15.34	3.44	14.58	15.92	4.51	12.67

NA Not Available

Note from 1950-51 to 1980-81, figures for Class XI-XII include Class IX-X

Data Source Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures are provisional

A keen observation of data in table-6 indicates the expenditure on elementary education and growth of secondary and post secondary education in India and Tamil Nadu. It could be seen clearly from the above table that growth of government expenditure on secondary and post secondary education is greater at the Tamil Nadu level than at the all India level during the period 2004-2005 to 2014-2015. Similarly the growth of secondary and post secondary schools, and also the growth of students' enrolment in secondary and post secondary level education. The correlation between growth of Indian government expenditure on secondary and post secondary education and growth of secondary and post secondary education is statistically significant at the national level and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on secondary and post secondary education and students' enrolment in secondary and post secondary level education is not significant. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

Table-7: Growth of Total Expenditure on Higher Education and Growth of Higher Education in India and Tamil Nadu

Year	India			Tamil Nadu		
	Expenditure	Higher Educational Institution	Students enrolment	Expenditure	Higher Educational Institution	Students enrolment
2004-2005	96478509	13921	13032186	5049465	1698	1324568
2005-2006	114134230	17332	14323566	5529308	1709	13426562
2006-2007	128129400	20186	15257893	5880468	1766	1345569
2007-2008	147629526	23505	17211216	6527409	1809	1346785
2008-2009	201505942	24698	1966785	11003328	1867	135426
2009-2010	232610402	26379	20740740	10783886	1979	1385251
2010-2011	322666304	34968	2642656	14118370	2042	1394265
2011-2012	369942827	35494	28562693	14784123	2368	2964487
2012-2013	387110761	36192	30152417	14585908	2428	3214167
2013-2014	500529219	39258	32336234	19844718	2536	3352881
2014-2015	527747620	39870	34211637	22575062	2426	3352881
CV	56.43	32.43	58.68	49.95	15.67	119.62
Correlation		0.68	0.58		0.13	0.09
Annual Compound Growth rate	16.71	10.04	9.17	14.58	3.3	8.81

NA Not Available

Note from 1950-51 to 1980-81, figures for Class XI-XII include Class IX-X

Data Source Ministry of Human Resource Development, Government of India / National Institute of Educational Planning & Administration, New Delhi

* Figures are provisional

A study of data in table-7 indicates the expenditure on higher education and growth of higher education in India and Tamil Nadu. It could be seen clearly from the above table that growth of government expenditure on higher education is greater at the national level than at the all Tamil Nadu state level during the period 2004-2005 to 2014-2015. Similarly the growth of higher educational institutions and also the growth of students' enrolment in higher education. The correlation between growth of Indian government expenditure on higher education and growth of higher education is statistically significant at the national level and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on higher education and students' enrolment in higher education is not significant at the Tamil Nadu state level. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

Conclusion

The findings of expenditure on education and Gross Domestic Product in India indicate the following facts. The share of educational expenditure growth rate is low; the growth of aggregate expenditure on education is higher during the period 1951-1952 to 2014-2015 in India. It is significant to note that the Indian GDP expenditure on education and share of educational expenditure was low during the period 1951-1952 to 1990-1991. In India the

increase in GDP educational expenditure and increase in share of education expenditure has been observed during the post reform period from 1990-1991 to 2014-2015 consequent up on economic reforms, along with expansion of educational opportunities and implementation of new educational schemes such as educational for all schemes and right to education act.

The findings growth of number of recognized educational institutions in India reveal the following facts. In India the growth of colleges ranks the first position during the period 1950-1951 to 2015-2016, growth of secondary and post secondary schools the second, growth of upper primary schools the third, growth of universities the fourth and the growth of primary schools the last. In absolute number the primary schools constitute first rank, upper primary schools the second, secondary and post secondary schools the third, colleges the fourth and universities the last. The growth rate fluctuation is low in primary schools and it is above 60 per cent in the case of growth of colleges and universities in India during the period 1950-1951 to 2015-2016. The high level increase in educational institutions in India is attributed to the enhancement in educational expenditure in India during the period 1951-1952 to 2015-2016.

The findings of expenditure on elementary education and growth of elementary education in India and Tamil Nadu show the following facts. The growth of government expenditure on elementary education is greater at the all India level than the Tamil Nadu state level during the period 2004-2005 to 2014-2015. Similarly the growth of elementary schools, but the growth of students' enrolment in elementary level education is higher in Tamil Nadu than the all India level. The correlation between growth of Indian government expenditure on elementary education and growth of elementary education is statistically significant and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on elementary education and students' enrolment in elementary level education is not significant. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

The findings of expenditure on elementary education and growth of secondary and post secondary education in India and Tamil Nadu indicate the following facts. The growth of government expenditure on secondary and post secondary education is greater at the Tamil Nadu level than at the all India level during the period 2004-2005 to 2014-2015. Similarly the growth of secondary and post secondary schools, and also the growth of students' enrolment in secondary and post secondary level education. The correlation between growth of Indian government expenditure on secondary and post secondary education and growth of secondary and post secondary education is statistically significant at the national level and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on secondary and post secondary education and students' enrolment in secondary and post secondary level education is not significant. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

The findings of expenditure on higher education and growth of higher education in India and Tamil Nadu reveal the following facts. Growth of government expenditure on higher education is greater at the national level than at the all Tamil Nadu state level during the period 2004-2005 to 2014-2015. Similarly the growth of higher educational institutions and also the growth of student's enrolment in higher education. The correlation between growth of Indian government expenditure on higher education and growth of higher

education is statistically significant at the national level and it is not significant in the case of Tamil Nadu. The correlation between government expenditure on higher education and student's enrolment in higher education is not significant at the Tamil Nadu state level. This may be due to expenditure might have incurred towards wages and salaries and other infrastructural development.

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Multifarious Network Attacks and their Corresponding Security Mechanisms

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Abstract

Network security is a major challenge in this modern era where everything on the real-time usage things are directly or indirectly associated with a network. With the evolution of internet across the globe, the Network systems are more prone to be attacked by the hackers and illegal intruders who try to steal the data. This paper deals with the major vulnerability and network security attacks and preventive measures that which has been taken to prevent them. Vulnerability attacks include the malicious software that which are inserted a system, which replicates by itself and causes damages to the entire system making many problems to the security of the networks like denying services and stealing of sensitive information. Some major types of malicious vulnerability attacks are Trojan, Worms, Rootkits, Spyware and Botnet. The major other security attacks that which is going to be analysed are Man in the middle attack, DNS Poisoning, ARP Poisoning and Denial of service. These security attacks use different techniques to attack the network system and cause the network to dysfunction. In this paper, detailed mechanisms of network attacks and their corresponding security measures are briefly explored and analysed. Various attacks follow different attacking systems and different solution has to be bought to solve their problems and protect the network system.

Keywords: Trojan; Worms, Rootkits; Spyware, Botnet; Man in the middle attack; DNS Poisoning; ARP Poisoning; Denial of Service;

Introduction

In Network security, the major challenges faced are vulnerabilities and hacker attacks. Vulnerability includes the malware like Trojan, worms, rootkits, spyware and botnets. This malicious software is replicated within itself and causes the network system to collapse. These are generally termed as attacks. The next type of network attacks includes the third party directly involved attacks like man in the middle attack, DNS poisoning, ARP poisoning, Denial of service. These attacks try to steal the original data or modify the data that which is been transmitted during the network transmissions. However, there are many steps to prevent the attacks the attacker gets smarter and somehow intrudes into the system and breaks the system security. Due to the increase in the internet, many things have been automated. Almost every possible thing have been now available online like shopping, money, transfer, government files, banking. Information's like username and password even personal identity like aadhaar card details and many more are made available on internet and system networks. Therefore, it is very much important to keep the data transmission safer and secured. Many problems are rising due to the attackers who harm

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the system by stealing the data. Online frauds have increased enormously. The attackers identify the “soft spots” that which are present in every network. To prevent the attackers intruding in the system many steps have been taken and network security has been made secure by certain techniques, which are explained, detailed in this paper.

1. Trojan

This is also termed as Trojan horse and it is a type of information stealing attack where a windows box arises and it prompts the use to enter the username and password of the user. This window looks exactly like the original window and when the user enters his details, the attacker steals the information and it sends the window error for the bad password. Opening a wrong email or downloading a wrong software module from internet can cause this Trojan horse to grow up.

2. Worms

Worm is type of computer attack, which does not require any human action to attack the network. It replicates itself and harms the system by transferring files, which are infected to be spread within it. These self-replicated files produce harmful effects and defoliate the entire networking system. Worms are of two types namely mass mailing worms and network aware worms. As the name implies mass mailing worms uses mail as a medium of transferring infected files over the network. Network aware worm selects a particular network and attacks the network. Scalper, Morris and my doom are some examples of worms.

3. Rootkits

Rootkit is a malicious program, which contains a collection of tools to harm the network. One major difference of rootkits by other malware is that it attempts to prevent the malicious code entering into the system by preventing the detection of anti-viruses. This can be installed in the system by number of ways namely phishing and social engineering often giving remote access to the cyber criminals across the system. The symptom of the affected system involves that antimalware detecting antivirus's stops detecting the malwares.

4. Spyware

Spyware includes adware, key loggers that provide information about the networks to the attackers. Adware monitors the web browser activity and sends the targeted advertisements to the user's desktop depending on their browsing activity. This can even change the way a user's web browser working activity by installation of some helper options in browser objects. It changes the normal settings of the browsers web page to make the bookmark lists. Keystroke loggers are made in a design to capture logon ID and password on the mainframe of the dumb terminals.

5. Botnet

Botnet is also termed as killer web application. Because of its harmful nature it is been termed as killer application. Botnet has created a huge set of problems regarding crime in the hacker darkside. The victims of Botnets are primary innocent networks. This killer app targets a particular company or an individual market of networks. Botnets with hundreds to thousands of client's acts together to perform damage effect to the network system. In order to stop this botnet attacking the network system a more preventive measure to preserve the IRC channel has to be made.

These vulnerabilities are mostly self-replicating and cause damages to the system on their own damaging methods. Now we will move on to the major network attacks that which is

caused by a third party hacker or attacker who aims to steal the credential information's from the network systems in the research method section and solution to clear the attacks in result and analysis section.

Research Method

In the research method section we discuss about the various attacks that happens for systems that which are connected to the networks. The networks that which are prone to these types of attacks are always vulnerable to the security that which is needed to be maintained very confidentially.

2.1 Man in the Middle Attack

Man in the middle attack is one of the most common attacks happening around the network systems. A third party attacker gets the information's of the end user sender and receiver in the format of the certificate. The certificate once hacked gets to be forged by the attacker and it changes or steals the original information that which has been transmitted through the network system. MITM is mainly attacked in the forms of ARP spoofing, DNS spoofing based MITM attack; DHCP spoofing based MITM attack, IP spoofing MITM attack and SSL/TLS MITM attack.

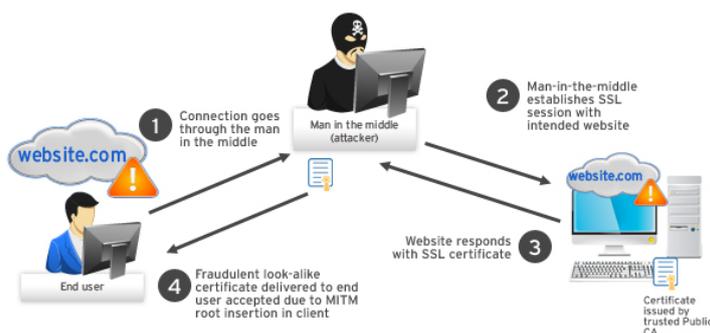


Fig 2.1 Representation of Man in the Middle Attack

[Source: <https://www.deepdotweb.com/wp-content/uploads/2016/10/word-image-20.png>]

In this type of attack, the third party is involved thus, it has been termed as session hijacking, TCP hijacking and termed as monkey in the middle. In MITM attack, the two ends termed as victims and attackers are at both end. The message sent from attacker termed as M1, message M2. Attacker intercepts the messages, and as a return, it sends M3 and M4, which are encrypted and stolen, from the attacker. Now after modifying the message it sends the message M5 that the attacker intercepts and decrypts it using victim's private key, then sends the encrypted message, and is received as M6 by the victim. Some other types of MITM attacks are BGP MITM and False Base Station based MITM.

2.2 DNS Poisoning Attack

The DNS messages that which are passed through the internet is very weak and are very much prone to DNS Cache poisoning attack. A fake response is produced in attempt to the cache poisoning attacks. The DNS messages that which are transferred without encryption or any other authentication systems are been more prone to this type of attack.

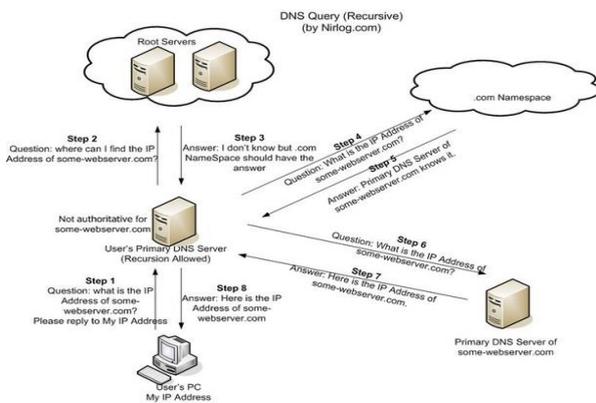


Fig 2.2 Representation of DNS Poisoning Attack

[Source:https://s3.amazonaws.com/s3.timetoast.com/public/uploads/photos/4453090/DNS_Server.jpg?1475033266]

In DNS Poisoning attack, the attacker launches a DNS query to the respected DNS server. Then the domain names that which is produced randomly comes in response to the NXDOMAIN denoting its existence and nonexistence from domain names. The attacker the forges the reply packets that contain the information's about the IP addresses and all the other details are taken into considerations. If the reply comes in bogus the cache server delivers earlier and then into the randomly accessed ID. The attacker in order to maintain the attacking system needs to detect that particular DNS server to be attacked and then identify the DNS poisoned which is weaker in security.

2.3 ARP Poisoning Attack

Address resolution protocol is one of the basic protocols used by most of the hosts in a network. Each device on IP network has MAC as well as IP addresses. Addresses of destination device is needed from the sender in order to receive the message safely. ARP cache comes in the process of data transmission. ARP cache poisoning is the major attack that which has been bought into limelight.

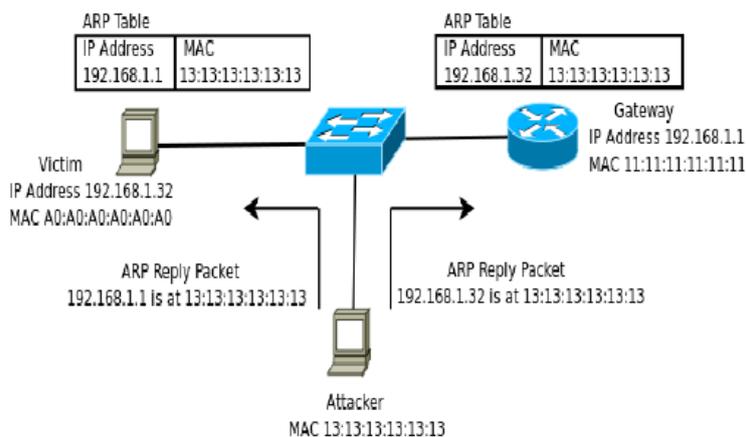


Fig 2.3 Representation of ARP Poisoning Attack

[Source:https://www.researchgate.net/profile/Abhishek_Samvedi2/publication/263048849/figure/fig1/AS:296563961286657@1447717766052/ARP-poisoning.png]

ARP Poisoning or ARP cache poisoning is a technique where the attacker injects a host with a wrong IP-MAC address. Host impersonation is a major type of network ARP attack where the packets are dropped into the received packets. The attacker can reply and can impersonate any host in the attacked network system. ARP Poisoning can be divided into four types if the following steps are seen. Unsolicited response providing fake response, A Request where the IP MAC is sent legitimately to ARP request, Response to a request where the unsolicited request or response is seen where the attacker gets the reply from the received chances and finally a Request and Response which holds the malicious host that which can send a fake reply to the legitimate request got by poisoning ARP caches of many hosts present in the network system.

2.4 Denial of service attack

Denial of service attacks are also called as DistributedDOS. In this attack the attacker takes the control of large number of computer systems that which are lightly protected.

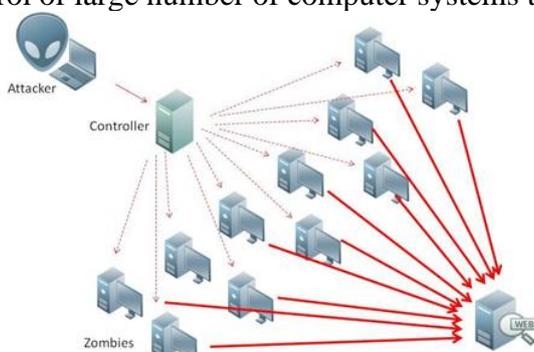


Fig 2.4 Representation of Denial of Service Attack

[Source: <https://i1.wp.com/www.howtogeek.com/wp-content/uploads/2016/11/ddos-650x300.png>]

These attacked systems does not have any basic protection like firewall or up to date antivirus softwares. Banks , corporate networks, government websites are mostly prone to this attack. The agent software modules installed in IRC usually communicates with the IRC networks, which then provides an easy way for attackers to secure secondary victims, which are involved in the attacks. Recently all the attacks have shifted towards economic crime and on the cyber warfare. These can be much harmful which leads to disruption in the presence of one systems attack. This attack can be prevented on the repertoire of various countermeasures. Suggestions has been made that “IP trace back” has to be followed to encounter this attack, DNS can be found using following mechanism they are by detecting the existence of an attack, Classification of the incoming packets for invalid packets and whether it is getting the responses of the attacks. Detection can be made to a network that some of the proactive qualities, which will render the ineffective network attacks, have affected it. The use of learning techniques for neural and radial basis, applying statistical signal analysis and use of multi-agent systems are some of the basic techniques to solve this attack.

3. Results and Analysis

In this section of results and analysis, we analyse the features that which gives the solution for the different network attacks and analysis the safety precautions that can be taken towards the network attacks.

3.1 Solution for Man in the middle attack

Man in the middle is termed together as a major threat to network security because of the wide range of attacks that has been caused to the network by various agents, which comes in the aim to steal the information from the networks.



Fig 3.1 Representation of solution to Man in the Middle Attack

[Source:<https://qph.fs.quoracdn.net/main-qimg-2977a0850d627c8f1070a14d47f7cae9>]

MITM can be resolved using Cryptographic solutions where the key transmission systems are authenticated using Authoritative key distributor(AKD) where we use public key cryptography to prevent the attack where ARP spoofing can be prevented. The next solution for the problem caused during DNS spoofing can be found by cache poisoning detection system(CPDS) where more secure system and entropy increasing mechanism are the other method to prevent the invalid DNS packets getting injected. The next attack been the DHCP spoofing which is prevented by using block responses from ports which do not have the servers associated with Dynamic ARP injection (DAI). IP spoofing based attack can be protected by source address validation enforcement(SAVE). The final major attack caused to the MITM been the SSL/TLS MITM attack causing the forged certificate been found out and server based methods mechanisms like multipath problems where third party are involved can be cleared by using the X.509 certificates and SSL/TLS handshakes.

3.2 Solution for ARP Poisoning

ARP spoofing can be eliminated by setting up network in such a phase those only legitimate devices that which are configured in the network can access the devices. When the network systems are large, it will become tough to restrict the devices involved in the system. Setting up static ARP is a basic solution to prevent network systems from being attacked by ARP poisoning. The devices with legitimate MAC addresses can only be configured on the network. The next method is to do the state full ARP mechanism, which tells that if the host receives two similar ARP reply packets, which comes from host to destination the two packets, will be discarded.

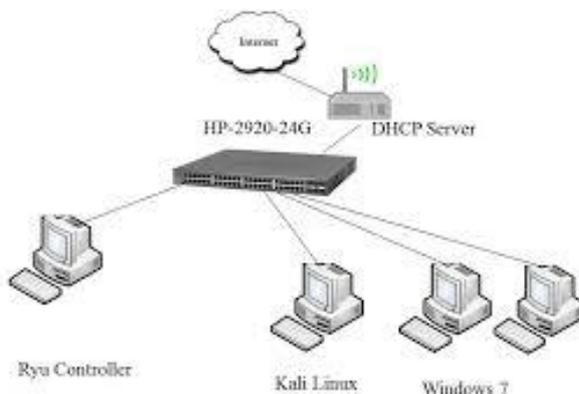


Fig 3.2 Representation of solution to ARP Poisoning

[Source: <https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7352813>]

Fuzzy logic controller will do this and the host will not be able to update its ARP cache. Secure ARP(S-ARP) is another method where the keys are digitally signed using authoritative key distributor(AKD) by the sender preventing ARP cache from getting poisoned-ARP provides security to the network using a local ticket agent(LTA).These tickets will have the expiration time until which it maintains the validity. The final technique that is followed for ARP poison prevention is active detection technique, which tells the detection of ARP poisoning without modifying the existing protocol.

3.3 Solution for DNS Poisoning

Many enhancements can be made to enable the DNS to re stand against the obstruct of the DNS attacks. With the recent increase in the global internet speed it is bit difficult to protect the DNS attack by substantial IDs.DNS query and DNS response are the two things that which needs to be analysed well enough in this section.

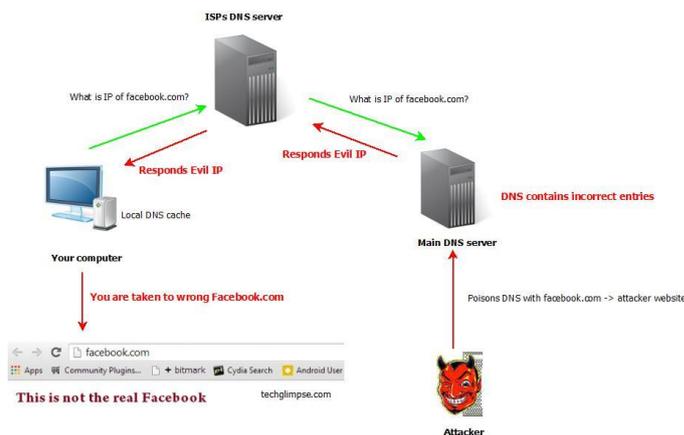


Fig 3.3 Representation of Solution to DNS Poisoning Attack

[Source:<https://techglimpse.com/wp-content/uploads/2013/11/dns-cache-poisoning-explained1.jpg>]

Public key infrastructure (PKI) like RSA, DSA and Diffie-Hellman are used for creating DNSSEC to create a digital signature for the authentication purpose. The second thing is that the increase in the share server's certificates and the third one is the DNS protocol that defines the entire structure. The system can be protected using some series of steps, that

which defines the problems into four sections namely Send_query, Receive_query, Send_Response and Receive Response procedures. As the name implies the DNS poisoning attack helps to respond to the query using ID1 and NS to the local server. It the represented figure above the solution is been given clearly. The request and response are seen clearly and the male DNS server and the evil request and response are seen clearly. Finally, the section deals with the computer that which takes the server to the wrong domain of the website, which is a fake website.

3.4 Solution for Denial of Service

Denial of service can be spotted by certain steps namely detection,classification and response.Detection can be either anomaly based or signature based.Classification can be done using the attack type that which has been detected.Response will be directly in the dependent phase of the timely report that which it gets from the attacker.

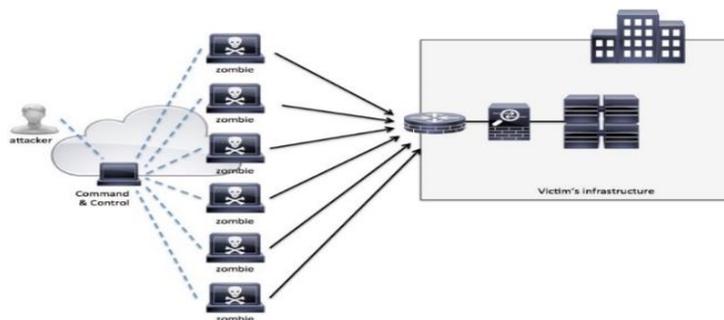


Fig 3.4 Representation of Solution to Denial of Service Attack

[Source:<http://studentnet.cs.manchester.ac.uk/stuk/resources/library/3rd-year-projects/2015/zhengquan.fan.pdf>]

The first way to find the Denial of service attack is by using learning techniques using genetic algorithms.A numerical technique called ART is followed which means Adaptive Resonance Theory.ART is trained well with types of varied inputs.Fuzzy techniques is also followed to solve this attack.Applying statistical signal analysis is another technique for finding Dos.Entrophy methods are applied using Hurst parameter.Other statistical approaches like fractional gaussian noise(FGN) is used to solve this attack and cumulative sum algorithm(CUSUM) is a change point detection algorithm which helps to make sharp changes on the variable to use Dos detection.Final type in detecting the DOS is by using multi agent systems.A gradient based learning technique along with the IP monitoring scheme tends to select the gradient based learning scheme for enabling of using more multi agent approaches from the concept of detecting firewall attacks.

4. Conclusion

In this paper a clear representation of different attacks, which are happening to the systems that which are connected to the networks are analysed, and their solution has been bought forward. From the major attacks like Man in the middle, ARP Poisoning, DNS Poisoning and Denial of service are clearly analysed and their solutions are given in a clearer manner. The other normal attacks as worms, Trojans and other small virus attacks also been analysed and their solution has been given. The Network security that which causes the entire system to fall and a safe mechanism has been followed. After successful analysis various security threats causing the system to fault tolerance are been well analysed and a secure manner is held for providing a more secured functionality of the system to work

properly and protect system from external attacks. Hence a more secure mode of activation of the system security has been carried out which enables the system to work without any problem and help the system to work in a fully secured manner.

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Parameter Selection for Vertical Handoff in Heterogeneous Wireless Network

Pragati T Kene*

Dr. S.L. Haridas**

Abstract: The developing science and technology is leading and reshaping our lives. The deployment of smart and ever growing varied wireless networks & the development in the mobile device designs is the main reason for this drastic change in our lifestyle. Today's upcoming wireless technologies are consisting of varied types of networks which created many challenges such as mobility management especially switch over, resource management, location management, QoS provisioning, security and monetary pricing. Traversing between (heterogeneous) distinct trait networks demands for sound vertical switch over (handoff). The decision to choose appropriate parameters is a vital part in the judgment making of vertical switch over. There are variety of dynamic and non-dynamic parameters like network load related to network, user or the cell terminal which are included during making any judgment for vertical switch over, strength of the signal, velocity, BW, consumption of power, throughput (Th), cost, preferences of user. In this paper, the parameters which needs to be considered for making an appropriate switch over decision are discussed.

Keywords: Heterogeneous wireless networks, parameters, handoff.

Introduction

Switchover is having a foremost role in the selection of suitable network Base station, Channel or point of attachment amongst the available access network, when the mobile node do not receive proper QoS to continue the ongoing session and there exists a threat of serious disturbance which could annoy the user or even a call drop which is not at all acceptable.

A switch over mechanism is initiated as soon as one of the actions under takes place:

- (a) Fresh utility assistance is asked for,
- (b) A consumer modifies their choices;
- (c) The terminal of cell identifies an obtains ability about different linkage;
- (d) Intense mobile wave deterioration/entire wave is lost in existing linkage [1].

Switch over depending on sort of switching between points of attachment can be distributed into [2]:

1. Horizontal/ Intra-cell /Intra-domain Switch over: This switch over process is among wireless networks with the same sort of access technology. It is the simplest sort of switch over with respect to implementation.
2. Vertical/ Inter-cell / Inter-domain/ Inter-RAT switch over: A switch over across networks possessing different sort of access technologies is vertical switch over. It occurs with the movements of the nomadic nodes across adjacent cell with base station having

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varied specification in terms of service, they provide and the protocol they use. There are further two types in this:

- a) Upward vertical switch overincludes, switch over from smaller coverage area to bigger coverage area network.
- b) Downward vertical switch over, which is exactly the opposite of the previous one.

3. DiagonalSwitch over: Diagonal switch over is nothing but the combination of horizontal & vertical switch overs. Switch over is known as diagonal one if cell node traverses across cellular area consisting of uniform core know-how.

Imperative switch over, which is the mandatory sort of switch over, to execute due to low QoS in the current network. Alternative type or non-mandatory switch over is the effect of the priority, given to the user preference. Proactive switch over takes help of history based knowledge, while reactive sort of switch over includes, the dynamic parameters & condition of the mobile and the network to reach a decision, for switch over. [2][3]

Depending on method used to place the connection, between the mobile user and the new cell, there are following types of switch over [3] [4]:

1. Hardswitch over: --first breaks the connection of the nomadic node with the old cell before getting the mobile connected with the new cell. Following are the few characteristics of this sort of switch over,

- One call utilizes only one single channel,
- Switch over procedure requires very less amount of time & normally it is not noticeable by the mobile user,
- Simple to implement and monetarily cheap,
- Data related to the mobile user and the session need not have to backup, since only one channel is used, thus this reduces the data overhead,
- There is a possibility that, the call might be interrupted for a short while or in some scenario by getting aborted.

2. Softswitch over: --It is where the connection is first made with the new cell and then the old one is disconnected. They have following features,

- Deploying numerous channels of the network to take care of a single call,
- Link dependability is elevated,
- Added intricate electronic circuitry in the cellular handset,
- Count of switch overs failed are lower.

3. Softerswitch over: -Softer switch overs are different than the above two in the sense, that in this instance, a fresh signal will be added to or removed from the set of active signals. Similarly, it may take place, while a signal is replaced by a sturdier signal from a dissimilar sector, under the current base station. This sort of switch over is obtainable in UMTS also in case of CDMA2000, wherein the identical channel/s can be utilized by numerous cellular phones, and wherein it is conceivable to nearby cells or cell areas, to utilize the identical channel of frequency.

Depending on, entity raising the switch over also the entity managing affairs of switches over methodology, following types can be defined,

- MIHO
- NIHO
- NCHO
- MCHO
- MAHO

• NAHO [4]

When any mobile terminal user travels from one location to another, the prime and foremost requirement is stable & sound connectivity and continuous reachability. The factors that affect the issue of mobility are described as under [5],

- Efficient Switch over: -Switch over should reduce or avoid the loss and delay of packets.
- Location Management: -The location management performs location update which appraises the caller the position of the called unit, in terms of relationship with its present location.
- Efficient Routing: -It is the procedure of choosing a path for traffic in a network to enhance network lifetime and its capability to promote packets.
- Security: -It is the avoidance of illegal access or damage.
- Scalability: - A network system is scalable when it has the skill to expand in terms of count of users and should be skillful enough to evolve continuously.
- Fault Tolerance: -Leniency towards fault is the ability of maintaining functionality when a portion of a system breaks down.
- Simultaneous Mobility: -Both end hosts can move simultaneously without interruption.
- Link Layer Independence: -Designing communications protocol to permit cellular phone consumers, to travel from one network to alternative though retaining an everlasting IP address.
- Compatibility between Routing: -This is successfully used to verify the compatibility between routing.
- Transparency: -It allows user's operating system or some other service to access a resource in absence of knowledge of the user and also not requiring to know, and customarily not being mindful of, whether the resource is situated on the machine, which is locally placed.

Performance Necessities of Vertical Handoff Decision Mechanisms

There are numerous tasks, while designing switch over mechanism such as need of low latency, low power drain, determination of right time for switch over and it should be skillful enough to work with commercially available devices. The vertical handoff index can be calculated dependent on the below given criterion derived from the literature [6][7]:

1. Stable & sound: Switch over is considered "stable & sound", if it is capable of retaining linkage with every technological feature & accessories functional on the cellular handset.
2. Packet loss: It quantifies and indicative of the amount of packets missed out during VHO procedure. It should be as low as possible.
3. Throughput (Th): It denotes about the rate at which, the data is delivered to the mobile terminals, during switch over. It is usually desirable to get higher throughput (Th) during switch over.
4. Switch over delay: This term is pertaining with the span of time required from origination to accomplishing the switch over procedure. More complex the process more is the undesirable switch over delay would be there. Switch over delay comprises of the addition of every delay concerned to switch over procedure.

There exists different sorts of delays in switch over. Switch over is a procedure that invites the involvement of many strata's of OSI model. Data link layer introduces delay due to scanning of the BS and is usually associated with horizontal switch over. Network layer is

liable for vertical switch over; it takes care of the IP address transferring. Many protocols like SIP, MIP which support switch over sit at session layer [8][9]. When data or information needs to be delivered among diverse layers, several kinds of impediments come into the picture, those are likely to hamper the value of QoS for the switch over.

Following are some of the delays which are usual to all types of networks [6] [7]

- **Serialization Delay:** It explains the time; it utilizes to encrypt the packet bits onto the bodily interface. This delay is usually fixed sort of delay.
 - **Propagation Delay:** It describes the period it takes, for a bit to get from first end of the link to another, the individual variable, which changes the propagation delay is the stretch of the link. This delay is usually fixed sort of delay. There are two considerations for this sort of delay one is about the Round (two way) trip delay that refers to propagation delay for bit to traverse from place of origin to destination and return to source. Other is the one-way delay from the initiation place to the destination.
 - **Queuing Delay:** Packets endure queuing delay, when they are required to hold for another new packet to be sent. The amount of queuing time can be comparatively enormous; hundreds of Milliseconds, or maybe larger than that. This delay is usually variable sort of delay.
 - **Forwarding Delay:** It is referred to the handling time in the midst of, while a frame is completely-received, and when the packet is positioned in an output train, so forwarding delay does not comprise, the time the packet stands in the output queue. This delay is usually variable sort of delay. Forwarding delay is characteristically a minor enough element to take no notice of, in complete delay.
 - **Shaping Delay:** Stream of traffic shaping has an effect of added delays, by attending queues more sluggishly. This delay is usually variable sort of delay. There are 2 kinds of traffic shaping methods one is transferring packets actually fast and having them be dropped and the other is transferring packets more gradually, but not having them be dropped.
 - **Network Delay:** This delay is usually variable sort of delay. It consists of propagation delay plus serialization delay.
- 5. Count of switch overs:** count of switch overs involved should be low, as frequent switch overs are likely to culminate into loss of power as well as network resources. This can be avoided by reducing the unnecessary handoff or the PPE.
- 6. Switch over breakdown possibility:** A switch over breakdown takes place at that moment of time, if the switch over process is started whereas the aspired linkage fails to provide with the necessary setup possessions to successfully complete it.
- 7. Energy Consumption:** Power is utilized by consumer terminal, and also power is consumed due to equipment's of the base station. Power is also spent during mobile switching or switch overs. During switch over, recurrent interface triggering can culminate into significant battery power loss. The concern of power economy also rises in network innovation, because avoidable interface triggering can raise power consumption.
- 8. Cell blocking probability:** This is about the likelihood of a fresh call being obstructed due to handoff process.
- 9. Call dropping probability:** It is about the possibility, that a call is concluded owing to delay in switch over process. This generally occurs while the speed of the mobile node is too high in other words the node stays in the new network less than the time necessary for handoff process to execute. This is also referred as missing handover probability.

Input Entities in Vertical Switch Over Mechanism

The judgement for vertical switch over is dependent on several entities like BW, QoS, and RSS, cost, latency, SIR, velocity, power consumption of battery, preferences of consumers etc. [10]

1. Available BW: BW in this context is usually described as the capability of link in a linkage. Bigger BW confirms lesser call dropping and blocking possibilities, hence offers higher throughput (Th).

2. Speed: The speed is nothing but the distance travelled by terminal of cellular phone per unit time. A high speed vehicle produces PPE and hence increases count of handoff, call blocking probability, call dropping probability.

3. Received Signal Strength (RSS): RSS is the main utilized measure because it is easy to quantify and is straightway associated to the quality of service. But RSS as a solo is not sufficient for a comprehensive decision. It is the power and energy of the received signal, if the RSS for adjoining linkage increases above the threshold the vertical switch over can be realizable.

Sometimes channel *quality* is represented by Signal power to Interference power plus Noise Ratio, RRM, SINR, RSRP, RSRQ,

4. Network Coverage: A network supporting larger coverage area helps mobile terminal users to avoid frequent switch overs as they roam about.

5. QoS: The degradation of QoS can be caused by a count of factors, including: Congestion, latency, location or re-transmission of missed packets, collision and lesser BW [11].

6. Power losses: The telecommunication devices working on battery need to use power judiciously. If the cell phone battery power level declines, changing from one network to another network with lesser power consumption can cater a better utilization time.

7. Throughput (Th)/ Average Data rate: Network throughput (Th) is all about the network's capability to cater successfully the information over a specific communications link.

8. Network Load: Changes in the traffic loads amongst cells will decrease the traffic-handling capability and thus quality of services.

9. Cost: A multi criteria algorithm for switch over should also think about the network cost factor. Usually user preferred network with low cost, especially if the application running currently is tolerant to delay and interruptions

10. Network Security: This is all about security of network, which comprises of the necessities and strategies implemented by the linkage to avoid, observe and control illegal access, modification, misuse.

11. Velocity: In the overlaid framework of distinct trait networks, while moving at large speeds is not recommended, since a switch over return to the previous network would take place very shortly later, especially while handing off to an implanted network, having lesser cell area [12].

Conclusion

An optimal handoff decision mechanism needs to possess non-static and static metrics. It is vital to think through optimal count of parameters; on the contrary, it is challenging to take account of all the parametric in a lone judgment model, owing to intricacy of algorithms and contradictory concerns of numerous sparametric.

Greater BW confirms lesser call dropping and call blocking possibilities; so it is expected to yield greater throughput (Th). To realize the utmost Privacy and confidentiality

structures should be inserted in the switch over mechanism. Consideration of velocity reduces count of unnecessary switch over, Handoff failure, PPE, call dropping probability, call blocking possibility and wastage of network resources. Velocity adaptive switch over algorithm and direction-biased switch over algorithm demonstrate high-quality outcomes whilst facing with the of corner effect problem. The intelligent switch over algorithms can decrease its outcome very well. Consideration of choosing the right moment to trigger a switch over helps in, maintaining the service quality up to a satisfactory level and reduction in a count of unnecessary switch overs. If a switch over is done too early, it wastes network resources by increasing count of switch over, otherwise, it causes failure. Depending on application, jitter can seriously disturb the quality of service. The count of switch overs is reduced by intelligent switch over algorithms. User Preference with regards to application need or regards to the monetary cost of the network helps to give better experience to the user or better user satisfaction level. Along with the input parameters, various switches over schemes also help to design an efficient handoff mechanism which can be implemented in the real world.

In short the networks to be considered for handoff mechanism design should be decided first such as LTE, 3G, Wi-Fi, WiMAX etc; then the sort of handoff such as vertical or horizontal, the method of handoff such as Soft or hard handoff, Alternative or Imperative should be decided. Proper selection of the parameters for the input needs to be done and then finally the handoff performance metrics should be evaluated.

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Socio-Economic Characteristics of the Juvenile Delinquents

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Abstract

Delinquency can and does occur in all social classes, urban and suburban, in small and large communities. It is not inextricably tied to race or sex. Society's injustices and cultural trends affect each individual, and in some way act as the catalyzing agents that triggers the overt misbehaviour of delinquency or other personal problems. In a complex society such as ours, there are indeed many ugly and destructive elements which need to be corrected, and the adolescent is bombarded by overwhelming stimuli daily. Even the healthiest adolescent has difficulty sorting out, assimilating and making sense of his environment. The adolescents we treat find their environment to be overwhelming and confusing because they experience an equally real, devastating inner chaos. We believe that nobody is a born criminal. Feeble mindedness, psychological imbalance, social inequities, aggressiveness and unreconciled malice springing from bad or unhealthy environment and parental neglect have individually or jointly made a normal person criminal or delinquent. Therefore, conditions leading to such unhealthy situations have to be improved and secondly, the victim of that situation has to be taken out of the vicious circle and requires proper treatment for his or her rehabilitation.

Key Words: Juvenile delinquency, jurisdiction, rehabilitation, psychological aggressiveness

Introduction

Crime is a universal phenomenon. Delinquency or crime is, in fact, an age old problem of every society and is being faced by all since the advent of the mankind. Crime is behaviour that deviates from the norms of a 'community' to a degree considered dangerously antisocial and punishments are specified for it in the criminal law. Stated more technically from the standpoint of legal criteria. Crime is an international act or omission in violation of criminal law, committed without defense or justification, and sanctioned by the law as a felony or misdemeanor.

Crime does not include all non-conformity, only that which is officially considered such a serious threat to the person, his property, or to the community institutions that agencies of government intervene and use sanctions to control it. It does not include all law violations. Crime is only those acts prohibited by specific norms in the criminal law statutes and cases, not in other areas of public law (constitutional, administrative, etc.) or of private law (contracts, property, torts, etc.).

Crime thus corresponds to violations of the mores in simpler, stable societies, except that criminal law norms and their underlying values lack uniform support. Crimes are distinguished from all other forms of problematic or deviant behaviour by their legal

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character. Crimes are defined by the legislative and judicial branches of a governing political area, such as a state or the federal government. The label "Criminal" provides the justification for involving the full powers of such reactive agencies as the police, the courts, and prisons. Defining an action as criminal allows the legitimate use of force by the state against its citizens and may lead to deprivation of liberty and in some jurisdictions or life with due process of law.

Juvenile Delinquency Defined: Juvenile delinquency consists of acts committed by persons under 18 years of age (17 or 16 in some states) or the conduct considered sufficiently deviant to warrant control by the juvenile court*. Before the rapid diffusion of juvenile court statutes, the first of which were adopted in 1899 in Illinois (USA), child offenders were punished under the criminal law and the concept of juvenile delinquency was unknown. It was created to exempt child offenders from the procedures and punishments of the criminal courts, and to emphasize protection and improvement of the child. Juvenile courts were also given jurisdiction over dependent and neglected children and the same informal (courts of equity) procedures were to be used for both this and the delinquency jurisdictions.

Delinquency as defined by Friedlander is a juvenile misconduct that might be dealt with under the law. Sheldon regards delinquency "as behaviour disappointing beyond reasonable expectations". It is clear that different social scientists have defined juvenile delinquency according to their own light and experience. Some have made the concept too wide to incorporate all the problems of juvenile misbehaviour, while others have focused only on that behaviour which amounts to a criminal offence. The second United Nations Congress on the Prevention of Crime and Treatment of Offenders (1960) points out that if the term "J.D." is restricted to those juveniles in each country who have committed criminal offences, it would seem that no universal definition is needed. Allowance could be made for the wide variations found in the legal systems of many countries of the world, but the inclusion under the "J.D." of acts

Source: Children and Crime. The Tribune. February 22, 1972 which are not serious and which can be classified as behaviour problems could be ruled out. If a clear and restricted definition of J.D. is established would it not be possible to focus more attention on the kinds of behaviour which need to be prevented? Thus, it is now generally agreed that J. D. should be demarcated from other problems of juvenile misbehaviour. Although the term J.D. may be confined to problems of serious misbehaviour, in many countries children having problems of misconduct, truancy, etc. are also dealt by the state.

Delinquency as a Social Problem

The occasional deviant in a highly stable society violates norms that are otherwise universally accepted and followed. A stable society based on kinship ties is relatively undifferentiated and the role of enforcer of the mores is assumed spontaneously by the wronged persons or, under appropriate circumstances, by other group members who see, or learn of the deviant conduct. Deviators from the mores are few, and are either quickly brought into line or eliminated from the society by banishment or death. The swift response requires no reflection; being dictated by tradition and it does not become a community issue. Violations of the mores thus do not constitute a social problem. When social change undermines the mores and political organization

begins to replace kin organization, informal sanctions against deviants from the mores are replaced by criminal law punishments, administered by occupants of official positions. The emergent criminal law norms presumably may become issues, at least where some degree of public discussion is possible.

When courts and legislatures identify particular deviant acts as crimes, the values underlying the legal norms are by implication universally agreed upon by the society or the officials believe they should be.

It has long been known that there is close relationship between broken homes and delinquency. The rate of delinquency among juvenile children from homes broken by divorce and desertion is higher than that among children from complete families or even from families broken by death. The broken home may be expected to show a child is more likely to be referred to the court as an official delinquent if his home is broken, but returned to his parents if his home is unbroken.

What goes wrong with these children? Why do they become delinquent? No singular phenomenon can sufficiently explain the reasons as individual acts in a particular way. Genetic endowment, the social, educational and economic milieu into which the child is born, the historical and cultural context into which the child is placed, the mother-child relationship, relationships with peers, social upheavals-these forces and more, intricately interwoven, influence and direct the course of development.

Importance of Delinquency

Delinquency can and does occur in all social classes, urban and suburban, in small and large communities. It is not inextricably tied to race or sex. Society's injustices and cultural trends affect each individual, and in some way act as the catalyzing agents that triggers the overt misbehaviour of delinquency or other personal problems.

In a complex society such as ours, there are indeed many ugly and destructive elements which need to be corrected, and the adolescent is bombarded by overwhelming stimuli daily. Even the healthiest adolescent has difficulty sorting out, assimilating and making sense of his environment. The adolescents we treat find their environment to be overwhelming and confusing because they experience an equally real, devastating inner chaos.

We believe that nobody is a born criminal. Feeble mindedness, psychological imbalance, social inequities, aggressiveness and unreconciled malice springing from bad or unhealthy environment and parental neglect have individually or jointly made a normal person criminal or delinquent. Therefore, conditions leading to such unhealthy situations have to be improved and secondly, the victim of that situation has to be taken out of the vicious circle and requires proper treatment for his or her rehabilitation. The uninhibited growth of crime is a major concern of all the societies today. Throughout the world the affluent countries are facing this ever-growing problem of crime. The developing countries are facing increasing rates criminality. It seems that crime, an inevitable result of economic growth, prospers and touches new heights along with the economic prosperity in the country.

Traditionally we believed that crime is related to poverty which is the motive for crime. This is no doubt true. The relationship between crime and poverty i. e. economic conditions cannot be ignored. But in contemporary situations this is not a sufficient or complete explanation. Today the curve of prosperity is being followed by a curve of crime. So to seek a fuller, complete explanation of crime a broader

perspective relating to the issues of various situations, social processes and social structure required. Today various new" forms of crime as white collared crimes have emerged. So there is a continuing need to understand more about crime, its causal factors and its relationship with development. This is "the need of the hour.

Conclusion: Delinquency can and does occur in all social classes, urban and suburban, in small and large communities. In recent years, juvenile delinquency has been one of the most widely discussed problems in India. Juvenile delinquency may be regarded as the reflection of a negative behaviour between the young person and the system of social regulations that Weber called "Legal-rational authority". We assume that the negative quality of this relationship is expressed both behaviourally and verbally. The behavioural expression takes the form of negative involvement in activities prescribed by formal authorities. Delinquency can and does occur in all social classes, urban and rural, small and large communities. It is not inextricably tied to a particular race or sex. Society's injustice and cultural values affect each individual, and in some cases it may act as the catalysing agent that triggers the overt misbehaviour of delinquents or other personal problems. In the recent years juvenile delinquency has been one of the most widely discussed problems in India. An undue percentage of young persons are allegedly coming into conflict with law. Newspapers, magazines, literary and religious journals all give enough space to the current problems of young offenders.

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Influence of Graphite and Aluminum Nitride reinforcements on friction and Wear Characteristics of Al6061 based Hybrid Metal Matrix composites

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Abstract

This paper reports on friction and wear of Al6061-Gr-AIN hybrid composites developed by stir casting technique. Percentage of graphite was varied from 0 to 6wt% whereas AIN was varied from 0 to 5wt% in steps of 2 wt%. Both alloy and its hybrid composites were subjected to microstructure studies, friction and wear test as per ASTM G99 standard test method. Friction and wear test was carried out by varying loads and sliding velocities. Further, cast alloy and hybrid composites were heat treated by solutionizing at a temperature of 530 °C followed by artificial ageing at 170 °C. Microstructure shows fairly even dispersal of hybrid reinforcements in the matrix alloy. Incredible enhancement in friction and wear characteristics was recorded with addition of hybrid reinforcements. Coefficient of friction decreases with hybrid reinforcements. Heat treatment has led to noteworthy enhancement in wear resistance when equated with unheat treated ones.

Keywords: Al6061 alloy, Aluminum Nitride, Graphite, Hybrid Composite.

1.0 Introduction

In recent years, there is an increased concern in manufacturing of hybrid aluminium metal matrix composites with improved physical and mechanical properties. This may be owing to fact that the use of two or more reinforcements in aluminium matrix augments the performance of composites by introducing exclusive new features. In addition these materials can reduce the cost and weight of the composites and their physical and mechanical properties are comparable or even superior to aluminium composites reinforced with single material. It has been reported by many researchers that, Synthesis of Aluminium based metal matrix composites using two or more reinforcing materials having unique characteristics not only contributes to reduction in cost also helps in property optimization of Aluminium composites [1-5]. Pramila Bai et al. [6] have considered the dry sliding wear lead of an A356 combination fortified with SiCP using pin on disk machine, for various loads. With extended connected weight, the unreinforced material showed significant wear debris generation. SiC particles were represented to confine the distortion on the wearing surface with iron rich layer on the composite surface. Dasgupta et al. [7] have analyzed dry sliding wear direct for both Al7075 base combinations with 15wt% SiC composites. The samples were exposed to T6 heat treatment and RRA

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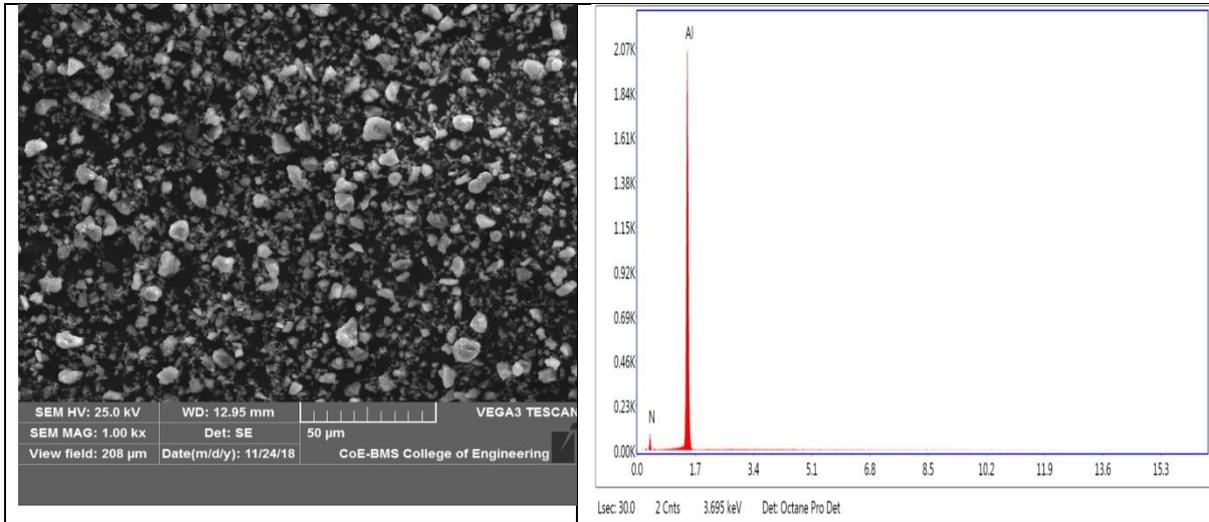
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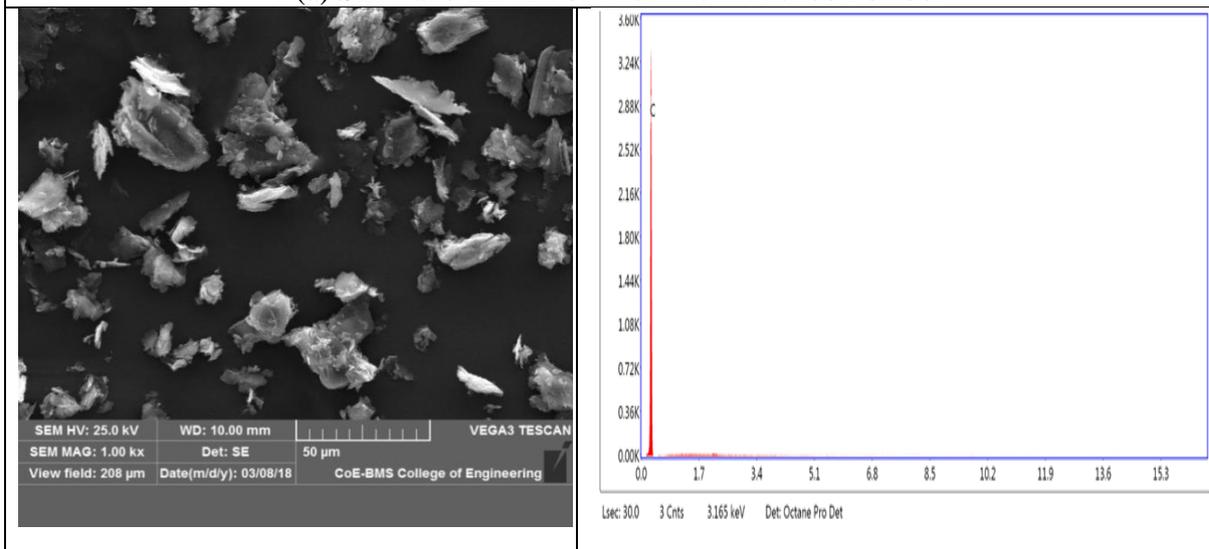
(retrogression and reaging). The sliding wear properties of the Al7075-SiC composites have significant change over the base alloy. On the off chance that there ought to be an event of heat treatment, the RRA has indicated better wear security properties when appeared differently in relation to the T6 treatment. In the last two decades, various types of reinforcements have been tried out by researchers in aluminum based composites. They are accessible in various morphology and an enhancement of any property of matrix relies upon kind of support utilized, interfacial qualities, and dissemination with volume portion. On the other hand, graphite is most economical reinforcement which has lower density, hardness, toughness and strength over a wide scope of temperature, great thermal shock and chemical resistance and in addition extraordinary wear and antifriction properties. Aluminum Nitride is additionally utilized as reinforcement attributable to its most superior hardness, low coefficient of thermal expansion (CTE), high temperature stability and chemical inertness with magnificent tribological properties. In perspective of cutting edge numerous mechanical applications there is a wide scope for hybrid composites. The significant segment of research has done just on either graphite or Aluminum nitride strengthened aluminum composite to enhance the mechanical and tribological properties of aluminum composites. The multiple reinforcements are utilized to beat the disadvantages of single one [8-10].

2.0 Experimental details:

Al6061 alloy was used as matrix material for developing hybrid metal matrix composites supplied by M/s Fenfe metallurgicals, Bangalore, INDIA. Aluminum nitride powder and graphite powder were procured from Sigma Aldrich. 0wt%, 1wt%, 3wt% and 5wt% Aluminum nitride was incorporated in the matrix alloy for synthesizing composites where as graphite particles were varied from zero to 6wt% in steps of 2wt%. The shape of the aluminum nitride was spherical and size was in the range of 10-20 microns where graphite particles were irregular having shape with particles size ranging from 20-40 microns. Fig.1 (a) and (b) shows the scanning electron micrographs of Aluminum Nitride powder and graphite particles with their EDAX pattern. The hybrid composites were fabricated by stir casting technique in which Al6061 was melted in graphite crucible at a temperature of 750°C. The electrical resistance melting furnace with stirrer was used for this purpose. Degassing of the molten Al6061 melt is carried out using hexachloroethane tablets. After degassing, preheated AlN and graphite particles were added to molten metal which is being stirred at 600 rpm and then poured in to metallic mould.



1 (a) SEM and EDAX of Aluminum Nitride Powder

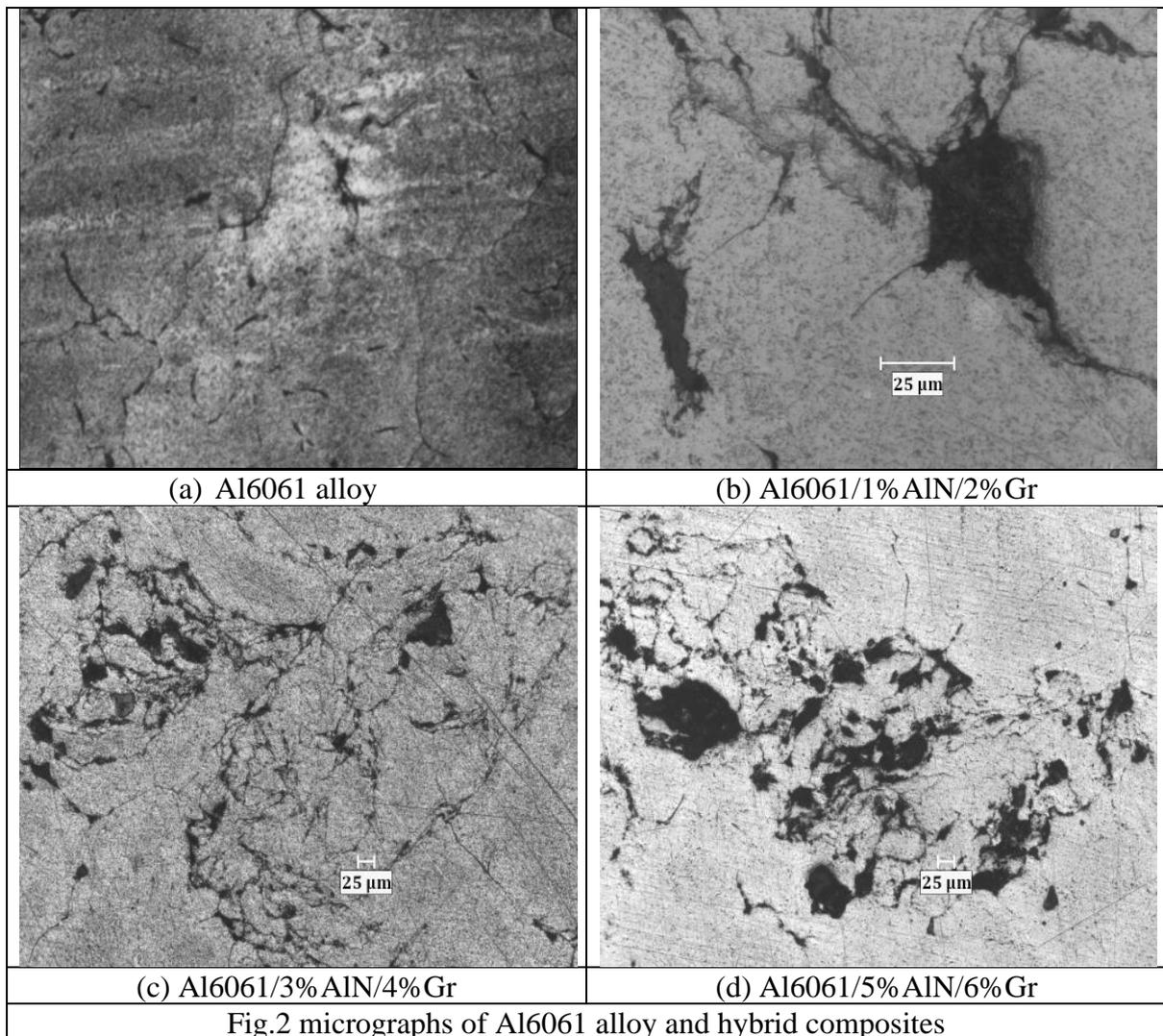


1 (b) SEM and EDAX of Graphite powder

3.0 Results and Discussions

3.1 Microstructure

Optical micrographs of Al6061 alloy and hybrid composites after heat treatment as per T6 conditions are shown in Figure 2 (a) – (d). As shown in Figure 2 (a), the microstructure consists of α -Al grains and precipitates in grain boundaries. The AlN particles were seen as grey phase while graphite particles were seen as dark gray phase in microstructure. Dispersal of the reinforcements was found to be uniform.



3.2 Coefficient of Friction

3.2.1 Effect of reinforcement

Fig. 3 demonstrates the after effect of Aluminum Nitride and Graphite content on the coefficient of friction of AL6061 hybrid metal matrix composites. It is seen from the diagram that all the composites have shown lower coefficient of friction when assessed with to that of Al6061 alloy. The lowest coefficient of friction was obtained for Al6061-3%Aluminum Nitride -3%E GF composite is almost 40% less that of Al6061 alloy. Addition of dual reinforcements (AlN + Gr) on the surface of the Al6061 hybrid composite goes about as projections which shield the matrix from having direct contact with the counter surface material. Due to their non-sticking and lubricating up properties, both the reinforcements decrease the contact zone between stick surfaces and counter surface which thus diminishes the grip of two mating surfaces. The grip is limited because of decrease in contact region of composite pin and counter surface bringing low coefficient for the composites while Al6061 alloy shows high because of direct contact between the two tribo-sets.

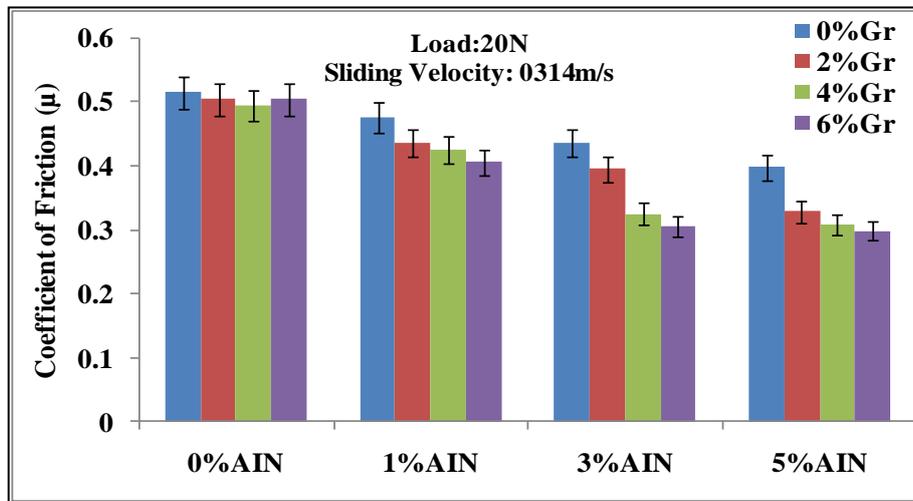


Fig.3 Effect of reinforcement on COF

3.2.2 Effect of load

Fig.4 shows effect of load on coefficient of friction of Al6061 alloy and its hybrid metal matrix composites. It is noticed that when there is an increase in load from 20N to 100N, friction coefficient is observed to be reduces for both matrix material and hybrid composite. Least friction coefficient was recorded for Al6061-6%WC-5%GF composite. The lessening in the coefficient of friction is largely credited to slippage between the surfaces steel plate and composite pin. As saw in both Al6061 alloy and its composites, increment in load causes increment in the contact region between tribo-mates. This thusly builds the temperature at the contact surface which prompts softening of stick surface along these lines causing slippage. Because of this slippage, friction coefficient in both Al6061 alloy and its composites found to diminish with increment in load.

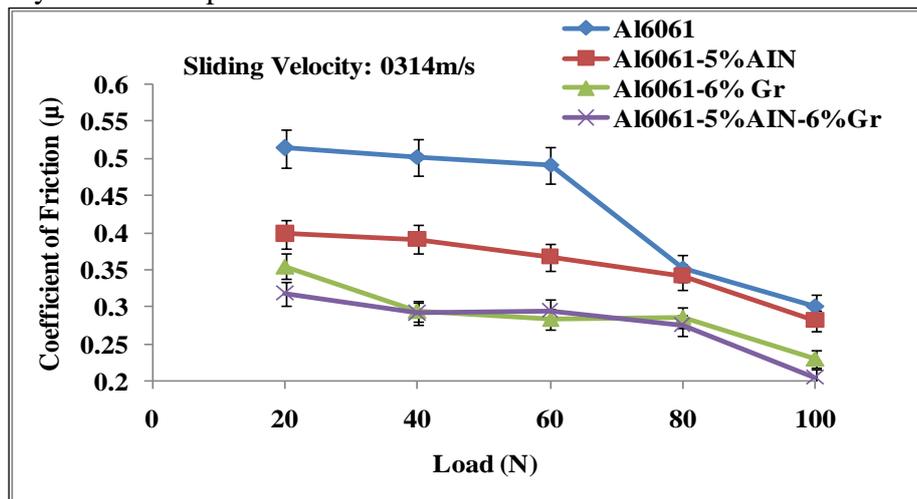


Fig.4. Effect of load on COF

3.2.3 Effect of Sliding Velocity

Variation of friction coefficient with respect to sliding velocity is presented in the Fig.5 it is seen from the graph that there is an increase in friction coefficient when sliding velocity is increased from 0.314 to 1.570 m/s. The maximum coefficient of friction is recorded for Al6061 composite especially at a sliding speed of 1.570 m/s. most minimal coefficient of friction was seen for Al6061-6%Gr-5%AIN for 0.314 m/s sliding speed. It is unmistakably

observed that, with the expansion in friction coefficient with the expansion in sliding speed can be credited to formation of plastic strains. With the increase in friction coefficient for all materials with the enhancement in sliding speed can be ascribed to advancement of extensive plastic strains. Plastic strain with increment in sliding speed advances and upgrades the attachment between the test-pin surfaces and counter surface. The grip between the tribo surfaces makes coefficient of contact increment. The plastic strain for all materials will increment with the expansion in sliding speed from 0.314 m/s to 1.57 m/s and the degree of adhesion strength of matrix material with the counter surface plate will be high.

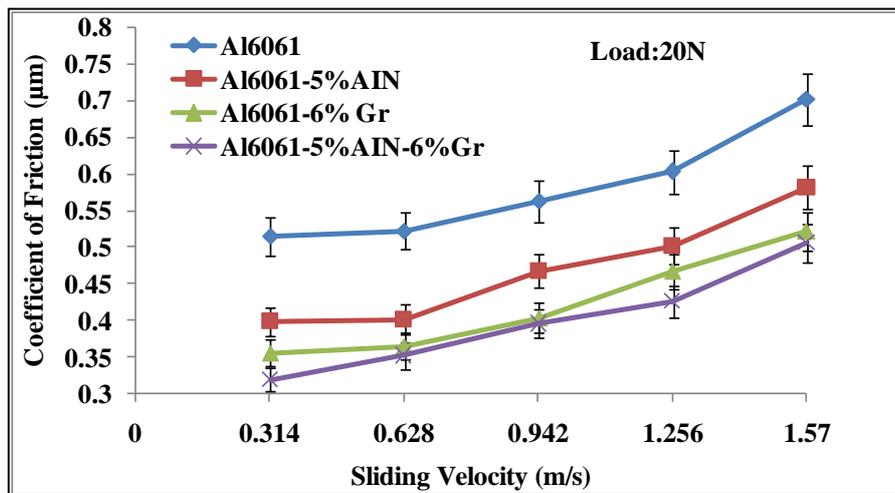


Fig.5. Effect of sliding velocity on COF

3.2.4 Effect of Heat Treatment

Fig. 6 illustrates the consequence of heat treatment on coefficient of friction of matrix alloy and its hybrid composites. It can be seen that the friction coefficient of heat treated matrix alloy and composites decreased when evaluated with that of unheated matrix alloy and composites. The results after heat treatment followed the same trend as that of without heat treatment materials. The heat treated Al6061-6%Gr-5%AlN displayed lowest coefficient of friction than rest of the materials while highest friction coefficient was seen in matrix alloy. It is notable that after heat treatment the Mg₂Si precipitates are nucleated in the α -Al which reinforces the Alloy or composites. With higher reinforcement content (AlN+Gr) the nucleation mechanism accelerates to higher level and structures all through the alloy. These consistently scattered encourages not just refine the grain size of α -Al yet contribute in Tribological property upgrade.

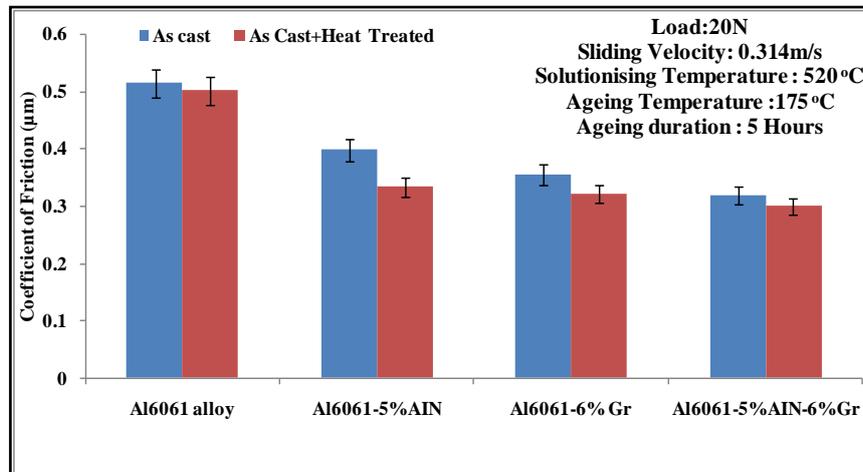


Fig.6. Effect of heat treatment on COF

3.3 Adhesive Wear

3.3.1 Effect of hybrid reinforcements

Fig. 7 demonstrates the impact of graphite and aluminum reinforcements on the wear rate of Al6061 composites. The decrease in wear rate is relatively 52% which clarifies wear resistance by high weight level of Aluminum Nitride and graphite content. It tends to be seen that Al6061-6%Gr-5%AIN hybrid composite has most astounding hardness. As per law of Archard's the wear loss of the material during wear test is contrarily relative to the hardness. In present case Al6061-6%Gr-5%AIN has most significant hardness due to presence of hybrid reinforcements the wear rate in this composite has showed low when assessed to other compositions. This is fundamentally in light of the fact that composites have superior hardness than the Al6061 alloy showcase intense encounter to the sliding wear.

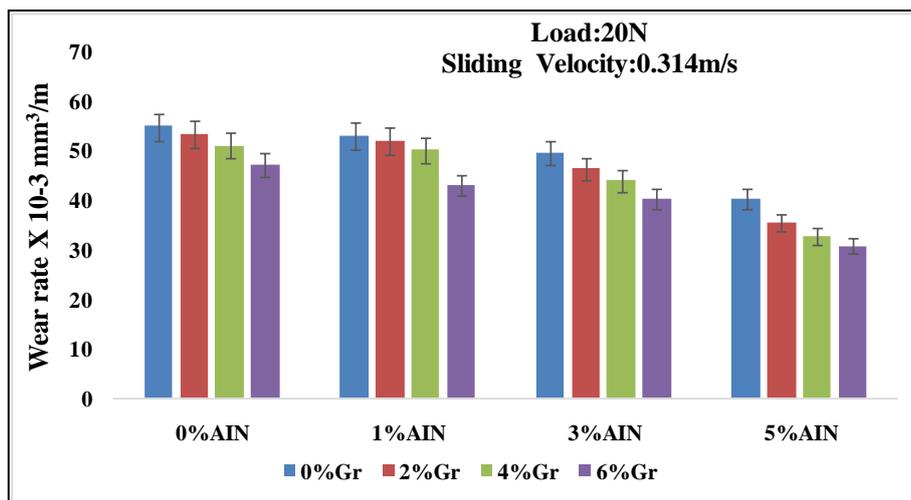


Fig.7. Effect of reinforcement

3.3.2 Effect of load on wear rate

Fig. 8 demonstrates the impact of load on wear rate of Al6061 alloy and its composites with sliding speed of 0.314 m/s. With the expansion in load from 20 N to 100 N, the wear rate of the considerable number of materials is expanding directly for every one of the materials. Most elevated wear rate was watched for Al6061 for 100 N loads while that of

least wear rate was watched for Al6061-6%Gr-5%AIN for 20 N loads. At beginning load of 20 N, the hard ill tempers of counterbalance surface enter the composite sample surface which prompts furrowing of scores on the alloy surface. Further, the development of scores is mostly because of delamination of alloy surface at this load shows mellow and oxidative wear.

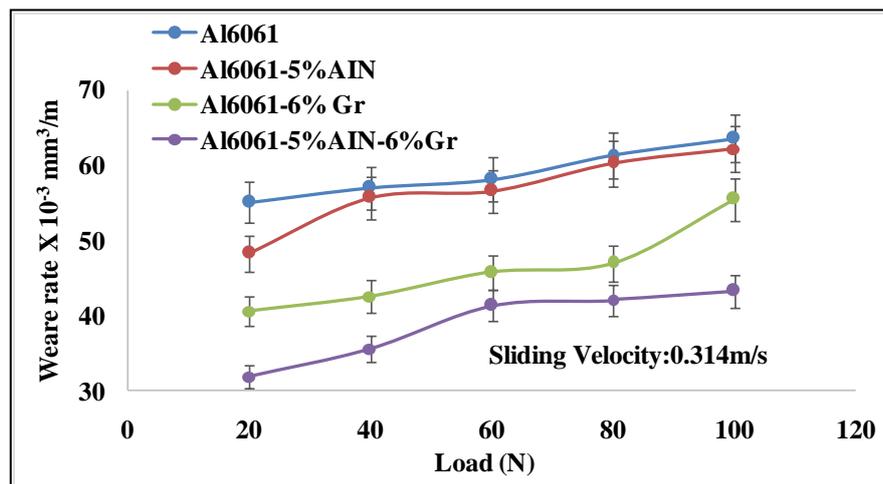


Fig.8. Effect of load

3.3.3 Effect of Sliding Velocity

Fig. 9 demonstrates the impact of sliding speed on the wear rate of Al6061 and its composites. The sliding speed was shifted from 0.314 to 1.570 m/s gradually by keeping load of 20 N consistent for all the sliding tests. It was seen that with the expanding sliding speed the wear rate of the considerable number of materials were expanding. The most remarkable wear rate was watched for Al6061 matrix at sliding speed of 1.570 m/s while least wear rate was acquired for hybrid composites with Al6061-6%Gr-5%AIN at 0.314 m/s. The expansion in wear rate is relatively 15% for increment in sliding speed is watched for combination.

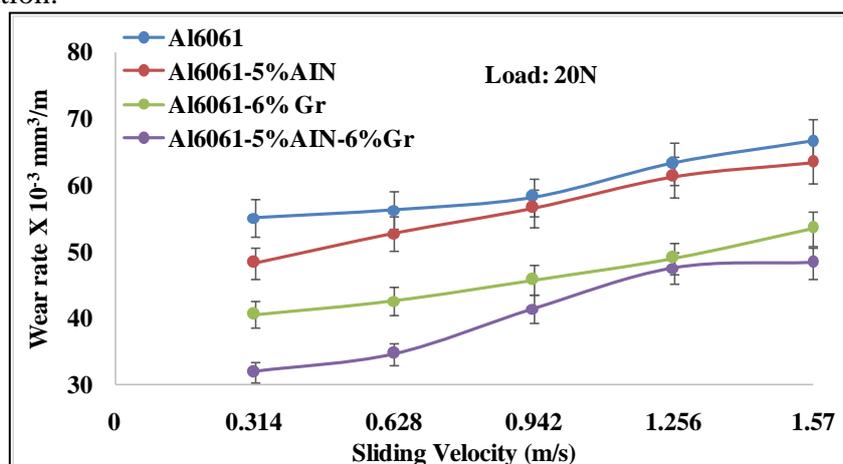


Fig.9. Effect of varying sliding velocity

3.3.4 Effect of Heat Treatment

Fig. 10 demonstrates the impact of heat treatment on wear rate of Al6061 and its composites. As seen from the graph, the trend noticed in the materials without heat treatment, the heat treated materials also showed a similar pattern. Critical drop in

coefficient of friction is seen in Al6061 composite after heat treatment. The drop is about 22% when contrasted with that of before heat treatment. This can be ascribed to nucleation of Mg₂Si metastable accelerates. These encourage reinforcing the Al6061 alloy alongside that of graphite and Aluminum Nitride particles.

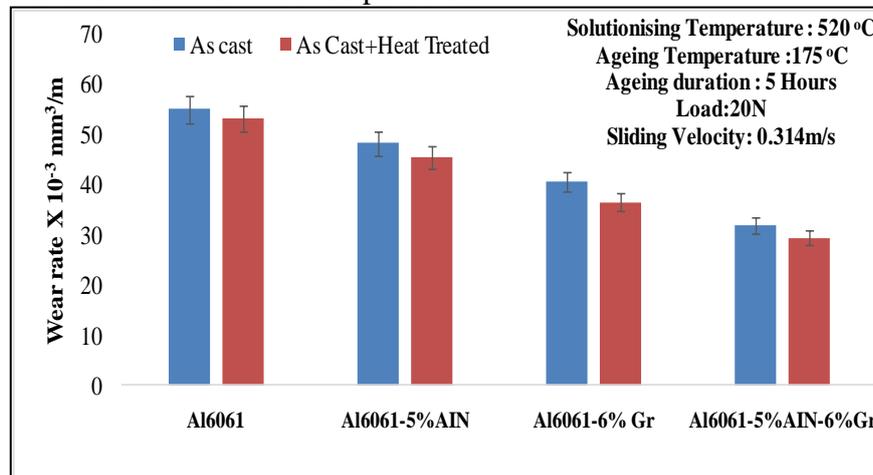


Fig.10. Effect of heat treatment

4.0 Conclusions

Coefficient of friction for Al6061 alloys and composites decreased with increasing reinforcement content, decreased with increase in load and sliding speed. Al6061 alloy and its composites after aging for 5 hours showed lower values when compared to the same materials in untreated conditions. Formation of Mg₂Si precipitates led improved the adhesive resistance of these materials which in turn helped in reducing friction coefficient values. Wear rate decreased with increasing reinforcement content, increased with increase in load from sliding speed.

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Lahore Resolution of Muslim League 23rd march 1940

Dr. Amir Jahan*

Arun Sharma**

The political developments in the Punjab precipitated during the last decade before Independence. The Pakistan scheme of Muslim League which was initiated by Mohd. Ali Jinnah during his Lahore conference in March 1940 shook the whole of Punjab. The Pakistan scheme of Mohd. Ali Jinnah was based on the demand for separate homeland for Muslims.

The Government of India Act of 1935 provided for the establishment of full responsible Government. Subject to safeguard in the eleven provinces of British India. It provided also a Federal Central Government and legislature for the management of all subjects except foreign affairs and defence.¹

Nehru had described the Act as a charter of bondage; and a Congress resolution of 1936 stated that the future constitution of India could only be framed by a constituent assembly based in adult franchise. League had criticized the Federal part of the Act as most reactionary but decided to work, the provincial part, for what it is worth.²

The congress coupled its condemnation of the Act of 1935. With the for reacting demand that the future constitution of India should be framed by Indians themselves by means of a constituent assembly elected on the basis of Universal Adult Franchise.³

This act or several orders issued by the Governor General in Council as late as 1936, made profound charges unlike most of the other provinces, the Act gave a uni-Cameral legislature to Punjab, although with a charged designation the Punjab legislature council was now styled as the Punjab legislature assembly . Its strength was increased to 175 elected members from different communities.⁴

Under the Government of India Act 1935, the elections in the Punjab were held in the beginning of 1937. The unionist congress and Akalis were the major political parties contesting elections. In the Initial stages of the election. Campaign the Akalis were against joining hands with the congress Master Tara Singh. SGPC president was opposed to any Sikh candidate in congres ticket. He felt that the congress could not be trusted if it hesitated in uploading Sikh rights in a matter like the Shaheed Ganj Gurdwara dispute.⁵

He also feared that the congress would keep aloof even if the Muslims attacked the Golden Temple and would not condomns murder of Sikh by Muslims.

Later, however, Akalis joined hands with the congress because Jawahar Lal Nehru, the then congress president in his letter to Master Tara Singh expressed sympathy with the Sikhs.

Secondly, the Akalis felt that alliance with the congress would help this in fighting against the Khalsa National Party.

Sir Jogendra Singh was authorised to issue a detailed manifesto he said in 7th August,1936 that the party stood for swarajya and was to work ceaselessly for its attainment by all constitution means. Dispute many imperfections in the new constitution the party were

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willing to work is to remove them. It would also devote its energies to Lord's abolition of the communal Award.⁶

The congress had formed a separate congress Sikh party for the elections in Punjab with the object of widening the base of the rational movement and for developing mass contact among the Sikhs. Jawahar Lal Nehru also used airplane during the election propaganda which happened first time in Indian history. He said that their success in election will be a symbol of a great victory.⁷

Dr. Kitchlew said during the election propaganda in Amritsar that if "It is a sin to attain freedom with the collaboration of Muslims then I shall commit this sin into the last collaboration of Muslims then"

I do not require even a single vote from you. He shared in Hindu-Muslim Unity.⁷

Pandit Pant also comes to Jullunder for election Propaganda. He said that a vote for the congress candidate was a vote for the nation's emancipation for stamping out poverty, unemployment, starvation and misery. Continuing Pandit Pant said a vote against the congress would be a vote for imperialism, foreign domination and slavery. If they wanted slavery any should repose full confidence in that great organization the congress which had been struggling and striving for India's freedom.⁸

In the 1937 elections, the league emerged as a complete party capturing a significant number of seats, under the Muslim electorate but lost in the Muslim majority Punjab, Sikhs and the N.W.F.P., Jinnah offered an alliance with the congress. Both the bodies would face the British together, but the congress had to share power, accept separate electorates and the league as the representative of India's Muslims.⁹

Regarding the attitude of congress, Jinnah stated in his presidential address that the present leadership of the congress, especially during the last ten years, had been responsible for alienating the Muslims of India more and more, by pursuing a policy which was exclusively Hindu, and since they had formed governments in the six provinces where they were in a majority, they had been by their words, deeds and programme shown, more and more that the Muslims, could not expect any justice or fair play at their hands.

The Muslim league got badly mauled when it met an ignominious defeat in the 1937 elections in the Punjab. In the other Muslim majority provinces in U.P. also the congress refused to form a coalition minority with the Muslim league. The Muslim League's defeat in the 1937 elections, convinced in that without taking recourse to communal mobilization with the battle cry of "Islam in danger" there was no hope for his and his party between the short span of elections may ups and downs came on the political scenes of the Punjab. The event started taking drastic turns with Muslim league's Lahore resolution of March 1940 where in Muslim League expressed its deep set desires to have a separate state for Muslims. The Muslims league's Pakistan resolution came as a bolt from the blue to all the political parties in the Punjab and it resulted in their instant reactions to their scheme.

According to the Muslim league, the Hindus and the Muslims constituted two different nations. This fundamental principle was articulated by Mr. Jinnah in 1940, while explaining the resolution of Pakistan, the Hindus and Muslims belong to two different civilizations.¹⁰

"We are a nation", he claimed. In the very eloquent words of the Quaid-I-Azam: "We are a nation without distinctive culture and civilization, language and literature, art and architecture, norms and nomenclature, sense of values and proportion, legal laws and

moral code, customs and calendar, history and partition, aptitudes and ambitions: In short, We have our distinctive outlook in life.

By all cannons of International law, We are a nation.¹¹

During the 1940-42 periods, the prestige and status of in All India Muslim League was considerably increased in the all India politics. Jinnah became the undisputed spokesman of the Muslim India

Which was also acknowledged by the British-Raj. Since early 1942, Jinnah's endeavor had been to strength the position of the Muslim league in the Muslim majority provinces of bengal and Punjab. Infact by this time, the Muslim league had gained considerable weight in Indian politics and this made Jinnah to directly intervene in these provinces.

In Punjab, he activated the Muslim league immediately after the death of Sikander Hayat khan in December 1942. The death of Sir Sikander Hayat provided to Jinnah the much covered opportunity of bringing the Punjab Muslims under his fold, But Sir Khizar Hayat Khan, who shared many of Sikander's views, was even more absolutely opposed to the idea of Pakistan.

He openly opposed Jinnah and refused to interpret his membership of league as allowing it to dictate to his and his followers in Punjab. Jinnah reacted with equal vigour of both with the league from which Sir Khizar was expelled in 1944 and in fomenting revolt any the Muslims of Punjab.

With the expulsion of Malik Khizar Hayat Khan from the membership of the All India Muslim League, a League-Uninist alliance which had survived for seven years came to an end. This was the beginning of a new era in the politics of Punjab Muslim League.

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An analysis of factors influencing consumer's online shopping behavior with special reference to organized retail market

Harsh Kumar*

Abstract

India has been gaining importance as a high potential remunerative marketplace for international retailers. Since the recent economic reforms, Indian consumers have just begun to understand benefits of using Internet for shopping. However, the growing number of Internet users has not been reflected to the online sales. Thus, it is important to identify factors affecting Indian consumers' online buying behavior in order to find the way to stimulate their online shopping behavior. The purpose of this study is to identify factors affecting Indian consumers' behavior toward online shopping by investigating consumers from Jaipur city, Rajasthan (India). For this study, perceived financial risk, product risk, convenience risk, Non delivery risk, online consumer reviews, return policy and demographic factors were identified after in-depth review of available related literature. For collecting data related to factors influencing consumer's online shopping behavior, 250 questionnaires through E-mail (linked with Google Drive) were sent randomly among consumers of online stores in Jaipur, Rajasthan city. Out of which we got response from 176 respondents. Finally Kruskal Walis (Chi Square) and Durbin-WatsonTest (Multiple correlation and regression), ANOVA, t-test employed in order to test hypothesizes of study. This study can be considered as descriptive research from purpose perspective and descriptive-survey with regard to the nature and method.

Keywords: Online buying behavior, perceived financial risk, organized retail market

1. Introduction

The Indian retail industry has emerged as one of the most vibrant and fast-paced industries due to the entry of several new players. It accounts for over 10 per cent of the country's Gross Domestic Product (GDP) and around 8 per cent of the employment. India is the world's fifth-largest global destination in the retail space. India's retail market is expected to nearly double to US\$ 3.6 trillion by 2020 from US\$ 600 billion in 2015, driven by income growth, urbanization and attitudinal shifts. While the overall retail market is expected to grow at 12% per annum, modern trade would expand as fast at 31% per annum and traditional trade at 10%.

India's Business to Business (B2B) e-commerce market is expected to reach US\$ 700 billion by 2020 whereas the Business to Consumer (B2C) e-commerce market is expected to reach US\$ 102 billion by 2020. Online retail is expected to be at par with the physical stores in the next five years. India is expected to become the world's fastest growing e-commerce market, driven by robust investment in the sector and rapid increase in the number of internet users. Various agencies have high expectations about growth of Indian e-commerce markets. Indian e-commerce sales are expected to reach US\$ 120 billion by 2020 from US\$ 30 billion in FY2016. Further, India's e-commerce market is expected to reach US\$ 220 billion in terms of gross merchandise value (GMV) and 530 million

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shoppers by 2025, led by faster speeds on reliable telecom networks, faster adoption of online services and better variety as well as convenience. (Source of data: www.ibef.org. 2016. *Retail Industry in India*. [ONLINE] Available at: <http://www.ibef.org/industry/retail-india.aspx>. [Accessed August 2018])

Online shopping is a form of E-commerce whereby consumers directly buy goods or services from a seller over the internet. Benefits of E-commerce have been grown very fast because of many advantages associated with buying on internet as the lower transaction and search cost as compared to other types of shopping. Online shopping allows consumers to buy faster, more alternatives and can order products and services with comparative lowest price (Cuneyt & Gautam, 2004). Consumer's attitude towards online shopping refers to their psychological state on terms of making purchases. The process of buying behaviour process consists of five steps. For instance, customers first identify a need or want and then define the requirements necessary to satisfy that need. Secondly, gather information and evaluate the options that are available. Once they know their options, they will look to make a purchase which will include shopping for or negotiating the best price they can achieve. Lastly, consumers will go through several factors which limits or influence final decision and they will evaluate whether or not they made a good decision. The main purpose of this study is to understand the factors that may influence consumer's attitude and behaviours towards online shopping. How consumers form such attitudes will be also focused on by researcher with the help of models and who are true online shoppers.

1.2 Problem Statement

On-line shopping is still in its early years in India but with the inception of digital revolution, the trend of on-line shopping will spread across the country soon. It is evident from the statistics available that Internet users in India are constantly increasing and are resorting to on-line transactions in different ways like e-banking, paying bills through mobiles and completing other transactions. Growth in e-commerce, especially online retailing has been observing due to spin in India's social and demographic characteristics. At the present moment it is realized that on-line retailers are aggressively pursuing on-line usage and their efficiency in operations like integration of supply chain, logistics and payment architecture has been increased. Geissler and Zinkhan (1998) claimed that the Internet shifted the balance of power in favor of consumers as it became very easy for them to make shopping comparisons and evaluate alternatives without being pressured by salespeople. Online stores reduce transaction costs and have advantage for both consumers and vendors.

These changes have accelerated an essential shift in the way Indians were engaged in conventional shopping and believing in touch, feel and see the actual products before buying. This is the time where one can see the alternate view of Indian customers who are opening up to on-line shopping due to time constraints and convenience because of their busy schedules and unavailability of the desired brands in the local markets. The point of this study is to inspect the various key factors influencing online consumer buying behavior. Researcher aims to examine the relationship between Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews; Demographic variables and online shopping behavior (OSB).

1.3 The objectives of the study

(I) Primary objectives

- To analyse the conceptual background of traditional marketing effectiveness as well as digital marketing effectiveness on online consumer buying behaviour.
- To identify the effects of major factors on online consumer buying behaviour.

(II) Secondary

- To study the impact of alleged risks by consumers toward online shopping.
- To study the impacts of effective return policy on online shopping behaviour.
- To analyse the impact of demographics variables on online consumer buying behaviour.
- To analyse the effect of on-line consumer reviews on online consumer buying behaviour.
- To measure the consumer's e-buying intentions and frequency.

1.4 Hypotheses of the study

Research is led to look for answers to the gaps in information that was distinguished and this study is not a special case. The framed hypotheses in this study was unresolved by the suggestion that Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews; Demographic variables have a great impact on consumers' online buying behaviour. In order to better analyse the research factors and reach the research objectives, following hypotheses have been framed:

H₁: Null Hypothesis (H₀₁): The Perceived financial risk will have no effect on consumer online Shopping behaviour.

Alternate Hypothesis (H_{a1}): The Perceived financial risk will have Negative effect on consumer online Shopping behaviour.

H₂: Null Hypothesis (H₀₂): The product risk will have no effect on consumer online Shopping behaviour.

Alternate Hypothesis (H_{a2}): The product risk will have Negative effect on consumer online Shopping behaviour.

H₃: Null Hypothesis (H₀₃): The Convenience Risk will have no effect on consumer online Shopping behaviour.

Alternate Hypothesis (H_{a3}): The Convenience Risk will have negative effect on consumer online Shopping behaviour.

H₄: Null Hypothesis (H₀₄): The Non-Delivery Risk will have no effect on consumer online Shopping behaviour.

Alternate Hypothesis (H_{a4}): The Non-Delivery Risk will have negative effect on consumer online Shopping behaviour.

H₅: Null Hypothesis (H₀₅): Effective Return Policy will have no effect on consumer online Shopping behaviour.

Alternate Hypothesis (H_{a5}): Effective Return Policy will have Positive effect on consumer online Shopping behaviour.

H₆: Null Hypothesis (H₀₆): There is no significant effect of on-line consumer reviews on online shopping behaviour.

Alternate Hypothesis (H_{a6}): There is significant effect of on-line consumer reviews on online shopping behaviour.

H₇: Null Hypothesis (H₀₇): There is no significant relationship between selected demographic variable and online shopping behaviour.

Alternate Hypothesis (H_{a7})::There is significant relationship between selected demographic variable and online shopping behaviour.

1.5 Rationale of the Study

With online shopping grabbing the eyeballs of many, understanding variables that influence the intention to buy through online needs more attention. This will help companies in identifying variables that play a major role in influencing customer's intention to buy there by helping them in crafting strategies which drives consumers to prefer online shopping. For instance, if an online retailer understands that perceived risks are high in certain categories that influence consumer's intention to buy, retailers can craft strategies to minimize perceived risks and drive consumers to buy through online.

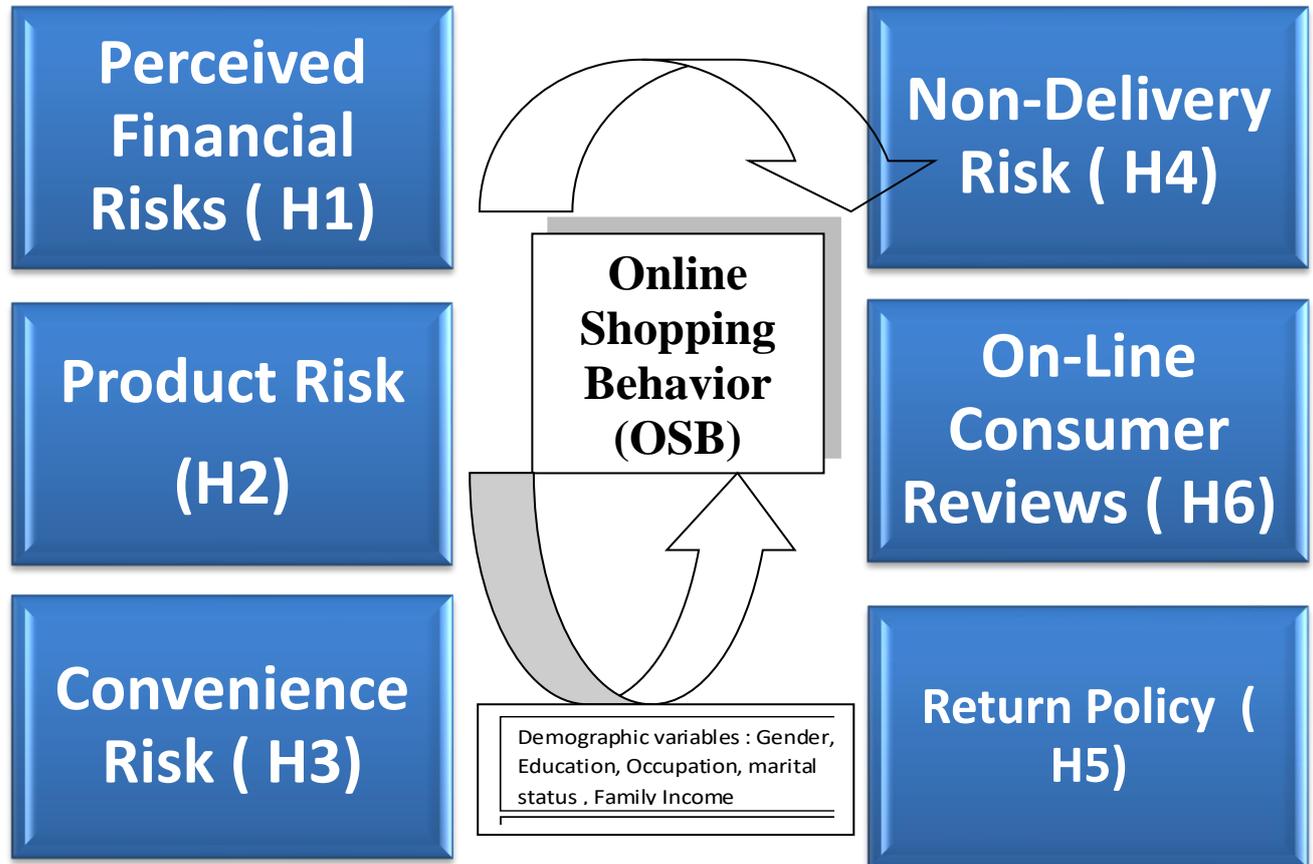
Earlier studies paid much attention to this topic in developed nations where internet penetration is high and consumers are highly evolved. For instance, Vellido et al. (2000) extracted nine factors associated with user's perception of online shopping. Among these factors the risk perception of users was demonstrated to be the main discriminator between people buying online and people not buying online. Other discriminating factors were Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews; Demographic variables.

However little attention is paid in India where internet penetration is significantly low and consumers are not so evolved in this space. Hence a need for such as study is identified by the researcher to see how far these variables are relevant in India and how much they influence consumer's intention to buy.

2 Theoretical framework of the study

The model which used in the present study was developed to examine the online shopping behaviors of Jaipur, Rajasthan based Indian consumers. This model examines the relationship between Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews; Demographic variables and online shopping behavior (OSB).

Chart-2.1



(Source: Compiled by Researcher)

The above studies discovered key factors favoring and resisting online buying of various products and services. In Indian online market, still less number of people are buying or selling the products and services. The factors resisting the online purchase behavior of customers discussed above provided researcher in depth understanding about factors influencing online shopping behavior and thus after analyzing demography of the selected research area, she found Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews; Demographic variables as selected key factors for the present study and responses have been collected and analyzed for the same.

3. Research Methodology

The present research work is undertaken to study the various factors influencing consumer's online shopping behavior with special reference to organized retail market. This section deals with the different methodological steps and procedures to be followed to carry out the present investigation.

3.1 Research Design

A Research design is purely and simply the framework of plan for a study that guides the researcher to collect and analyse the data. The study is intended to analyze factors influencing online shopping behavior of consumer's that might be one of the most emerging issues of online shopping and digital marketing in present scenario. This is a descriptive Research study.

3.2 Research Type: The research study is descriptive in nature. Research study describes the buying patterns of consumers. Descriptive research includes surveys & fact-finding enquiries of sampled respondents. The main characteristic of this method is that the researcher has no control over the variables; he/she can only report what has happened or what is happening.

3.3 Universe of the Study

In Simple words it is all the people about whom the study meant to be generalized (Jackson, 2008). The present study was limited to Jaipur district of Rajasthan state only. The purpose of this study is to analyze factors influencing online shopping behavior of consumer's that might be one of the most emerging issues of online shopping and digital marketing in present scenario. Therefore, the population of this research is defined as the customers who purchase products online in Jaipur.

3.4 Period of the study: July 2018- August 2018

3.5 Sampling and sample size:

Samples are defined as the group of people who participate in a study (Jackson, 2008). After reviewing the literature a method has been designed to achieve the objectives of research project. There is consideration of Jaipur district of Rajasthan state as population size of research study; so, sampling units are sub-geographical urban areas of Jaipur city of Rajasthan State.

For collecting data related to factors influencing consumer's online shopping behavior, 250 questionnaires through E-mail (linked with Google Drive) were sent randomly among consumers of online stores in Jaipur, Rajasthan city. Out of which we got response from 176 respondents. In order to validate the variables and other parameters, a pilot survey of small sample from Jaipur city was conducted by taking 20 respondents as sample size. Responses of the questionnaire were also tested with the help of SPSS 20 version software and also discussed the questionnaire with experts to take the opinions and their view points to improve and redesign the final questionnaire. The final questionnaire was prepared which has been enclosed here with for collecting data of Jaipur city.

3.6 Data Collection

The study is based mainly on primary data and supported by the secondary data. The primary data is collected from the respondents from Jaipur district with the help of questionnaire to evaluate their perspective regarding factors affecting online shopping behaviour. For this purpose a structured schedule based questionnaire was prepared and used by the researcher. Questionnaire was divided in to two parts. Part-A was used to collect information regarding demographics of the sample respondents which was one of the important factors affecting online shopping behavior and the information comprises of Age, Gender, Occupation, Education, Marital Status , Annual Family Income. Part –B was used to collect opinion of sample respondents regarding Perceived Financial Risks, Product Risk, Convenience Risk, Non-Delivery Risk, Return Policy, On-Line Consumer Reviews and its impact on Online Shopping Behavior. Their opinion was measured on five point Likert scale and coding of the data was done as follows:

Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
5	4	3	2	1

Secondary data include data collected from various sources, published as well as unpublished research papers, magazines, brochures, journals, periodicals, research papers presented in various conferences, books, internet websites etc. So, Literature Survey has been conducted to collect secondary data for the identification of different variables, probable contemporary issues, and clarity of concepts. This has been followed by primary survey.

3.7 Statistical tool for Data analysis and interpretation

Data analysis of respondents obtained was performed with the help of automated process. The data for achievement of objectives was analyzed using frequencies and percentages. The collected data have been tabulated and analyzed logical status using various statistical methods. In this study simple percentage analysis, Kruskal Walis (Chi Square) and Durbin-Watson Test (Multiple correlation and regression), ANOVA, t-test employed to interpret. Cronbach's (alpha) was used to establish internal consistency. Cronbach's (alpha) is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability. The Statistical Programme for Social Science (SPSS), a computer-based statistical package was used to generate descriptive statistics comprising of frequency tables and cross tabulations.

Adoption of Question details for analysis

Independent Variable	Source	Question Number	Section
Perceived Financial Risks	Forsythe et. al. (2006) Swinyard and smith (2003)	19-20	B
Product Risk	Forsythe et. al. (2006) Swinyard and smith (2003)	21-22	
Convenience Risk	Forsythe et. al. (2006) Swinyard and smith (2003)	23-31	
Non-Delivery Risk	Forsythe et. al. (2006)	32	
Return Policy	Lewis (2006)	33	
On-Line Consumer Reviews	George (2004) Lassar et.al(2005)	34-39	
Dependent Variable	Source	Question Number	Section
Online Shopping Behavior	Forsythe et. al. (2006) Karayanni (2003) Swinyard and smith (2003) Liang and Huang (1998)	8-18	B
Demographic variable	Source	Question Number	Section
Age, Occupation, marital status, gender, education, Income	Rick L. Andrews and Imran Currim (2008)	1-9	A

3.8 Testing of Hypotheses

Hypothesis testing is used to infer a result of a hypothesis performed on sample data from a larger population, which can be either null or alternate. In the present research, H1 to H7

Hypotheses were framed and tested. The objective of hypothesis testing is to either accept or reject the null hypothesis. To test the impact of demographic factors, cross tabulation, T-test, F-Test, ANOVA, Chi-Square Test have been used.

3.9 Contribution of the study

Based on the proposed objectives and Hypotheses of this study, retail companies may come to know about various risks associated with on-line shopping and thus would be able to formulate strategies to minimize these risks and consequently enhance consumer's trust in this form of retail. Present research provides suitable direction in making more user friendly websites. It also shows the way to the online retailers to improve their delivery system.

4. Discussion and Evaluation

This chapter analyses the primary data gathered by the researcher. The chapter commences with descriptive presentation and discusses the profile of the respondents in the sample. The purpose of discussing the profile of the respondents was to analyze whether the characteristics of the study sample represents the population.

4.1 Primary Data Analysis

4.1.1 Characteristics of Respondents

Population parameters normally influence various decision making process. This chapter analyses the descriptive and statistical analysis of primary data collected. This section deals with the demographic factors like Gender, Age, and Marital status, and Annual family Income level, occupation, Educational level of the respondents. The information thus collected from the 176 sample respondents and analyzed using SPSS software 20 version.

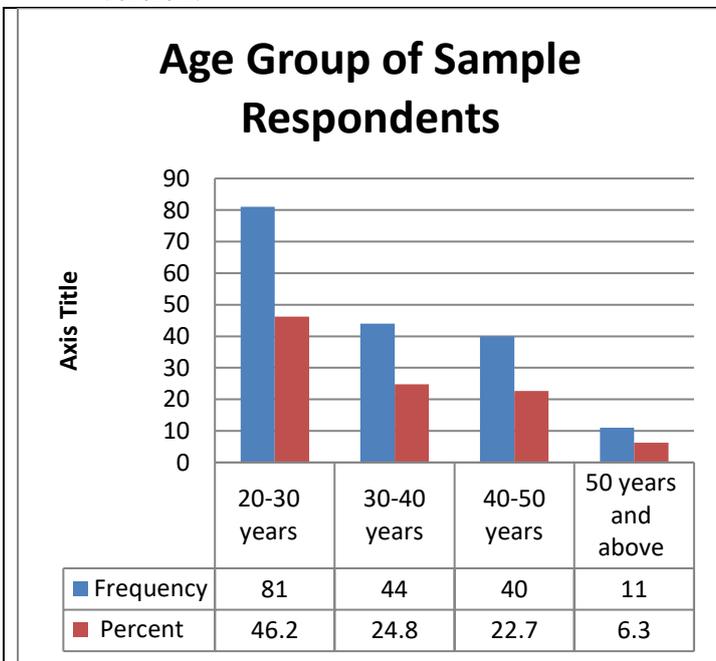


Figure- 4.1

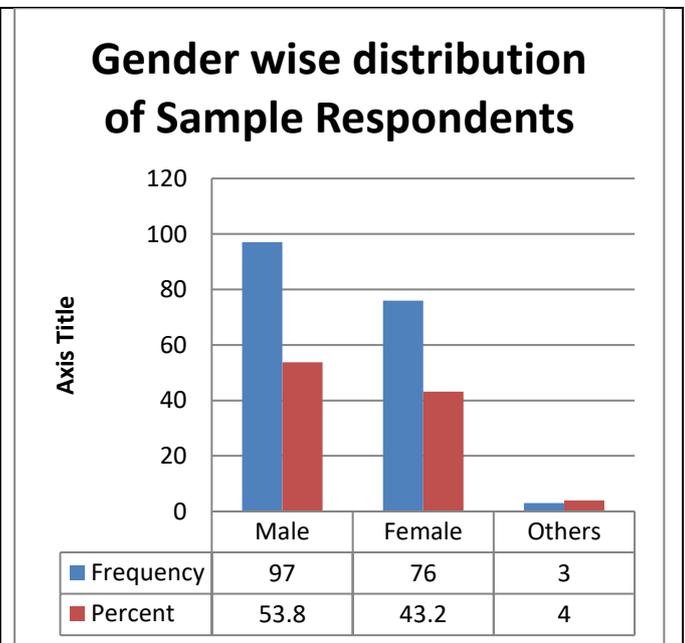


Figure- 4.2

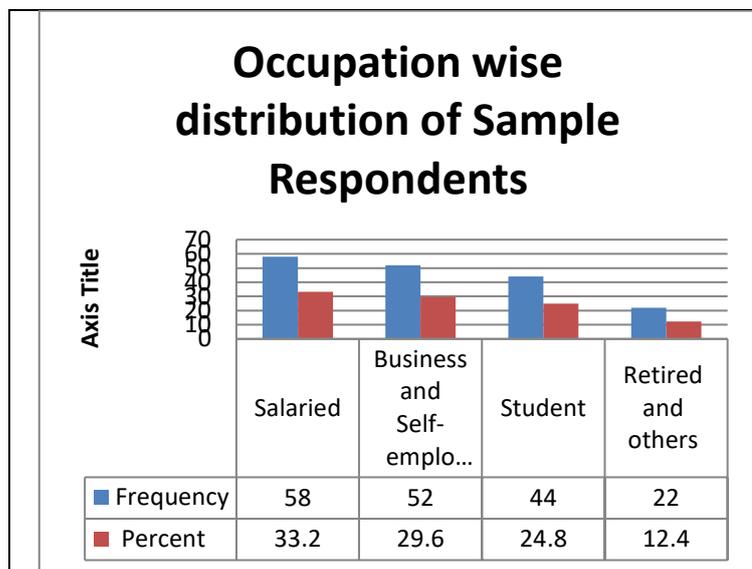


Figure- 4.3

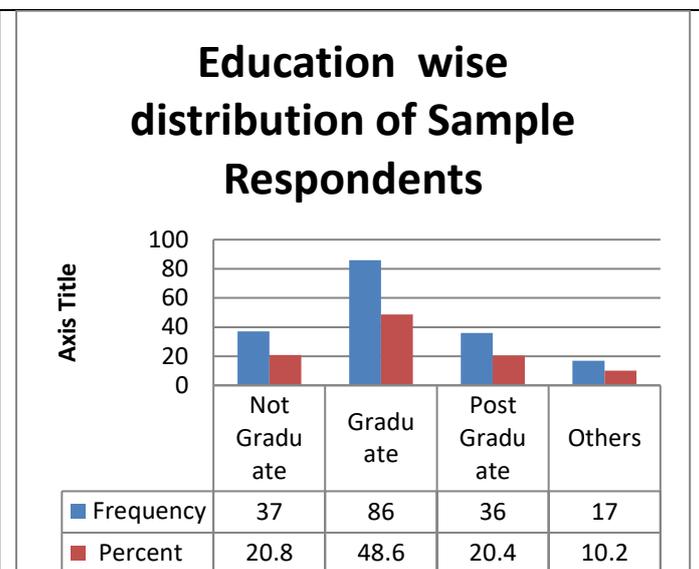


Figure- 4.4

(Source: Survey Data)

Interpretation: Above figures 4.1 to 4.4 demonstrate gender, age, occupation and educational level of the respondents. The figures imply that majority of the respondents were from 20-30 year age group whereas 47.5% of the respondents were from 30-50 year age group. The sample population comprises of 53.8% male and 43.2% were found females. As far as occupation is concerned, with 33.2% of the respondents salaried were on the top regarding online shopping. Business and self employed were next in the same line. Researcher also found that out of the total sample population 24.8% were from student's category. 69.0% of the respondents were either postgraduates or graduates. The researcher aims to collect data from those who shop online. Hence it can be stated that young salaried male with good education background were majorly engaged in online shopping.

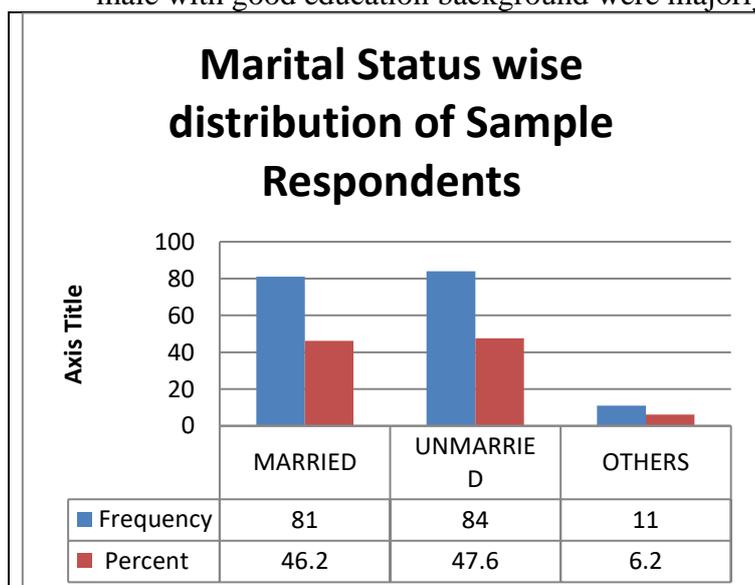


Figure- 4.5

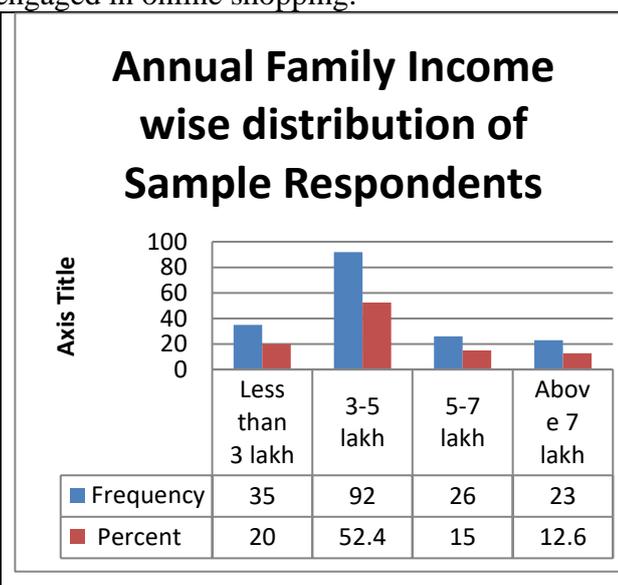


Figure- 4.6

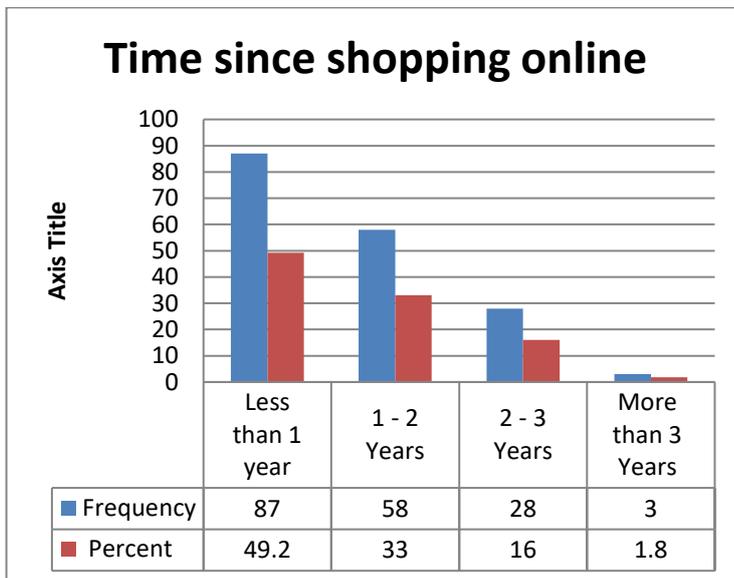


Figure- 4.7

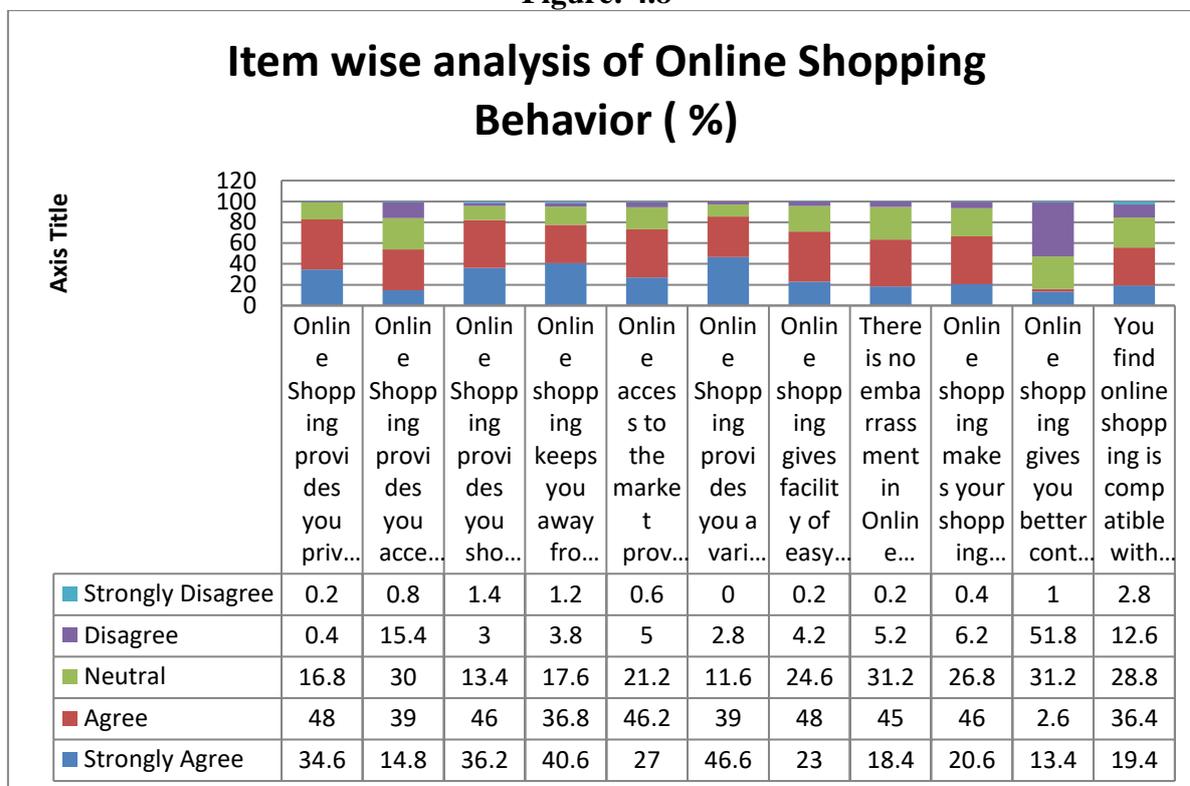
(Source: Survey Data)

Interpretation

Above figures 4.5 to 4.7 demonstrate profile of the respondents' marital status, annual family income and time since they are engaged in online shopping. Researcher found that there is slight difference in the frequency of marital status as 46.2% sample respondents were married whereas 47.6% were unmarried. 52.4% of the sample respondents were from annual income band of 3-5 lacs. 49.2% of the sample respondents have been engaged in online shopping since one year which implies that the craze for online shopping has been increased in the recent time.

4.2 Item wise analysis of selected factors

Figure: 4.8

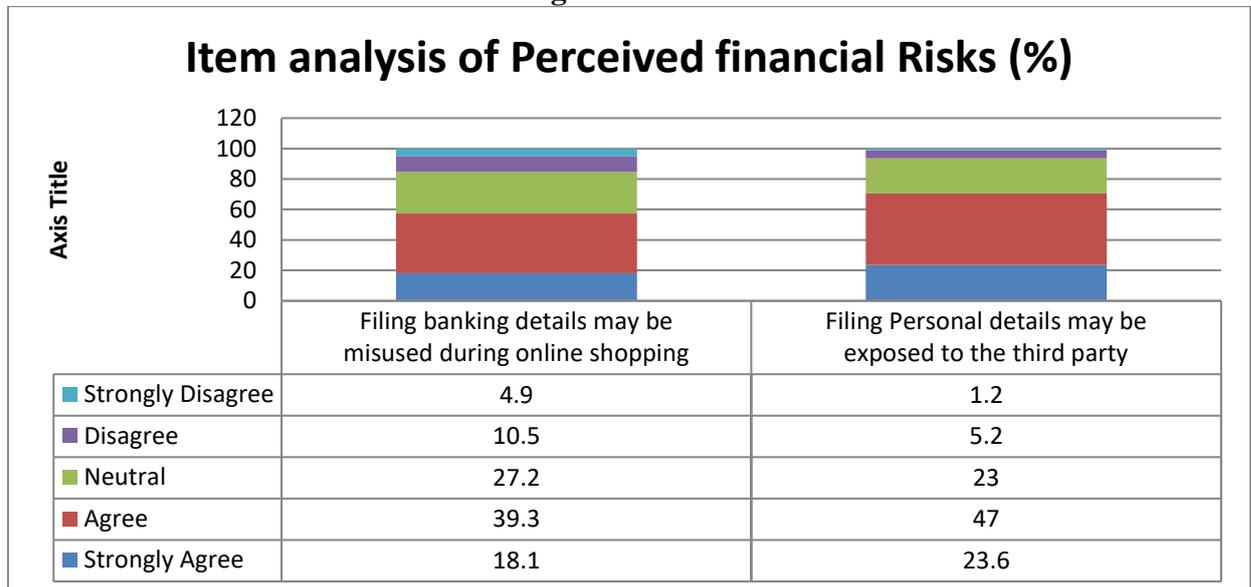


(Source: Survey Data)

Interpretation: It can be stated from the above data that 72.6% of the sample respondents have no issues regarding privacy. It reflects that sample respondent prefer online shopping due to the privacy feature. 53.8% of the sample respondents found online shopping easy and convenient as it provides them access to the market from their place. 82.2% of the sample respondents prefer shopping due to the flexibility of time. 77.4% of the sample respondents prefer online shopping as they feel that online shopping keep them away from traffic jam and market crowd. 73.2% of the sample respondents feel that online access to the market provides them detailed product information.

As far as variety of products range is concerned, 85.6% of the sample respondents feel that online shopping provides the opportunity for the same. 71% of the sample respondents were pleased with this mode of shopping since it provides them ease with price comparison. While doing offline shopping many of the buyers face embarrassing situations but it was a different case in online shopping as 63.4% of sample respondents felt no embarrassment while shopping online. Despite of all the positive sides of online shopping, 84% of the sample respondents felt that they could not control on their expenses while shopping online. 54.8% of the sample respondents found online shopping compatible with their life-style.

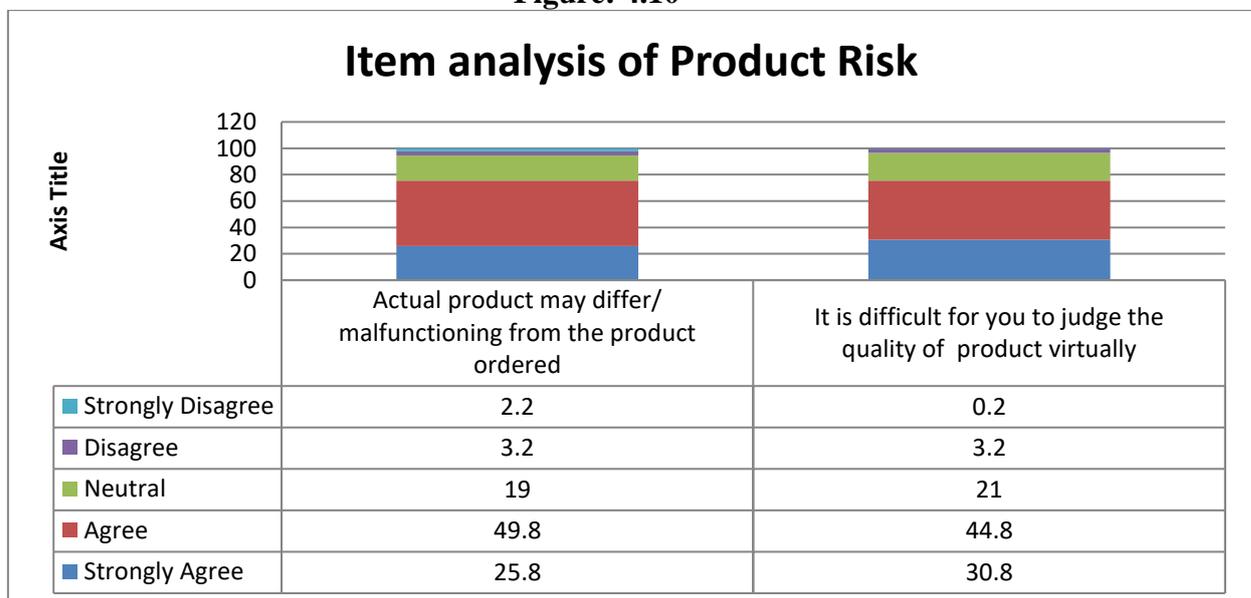
Figure: 4.9



(Source: Survey Data)

Interpretation: 57.4% of the sample respondents believed that during online shopping their banking details might be misused where as 70.6% believed that their personal detail might be exposed to the third party. Researcher found perceived financial risk as a hurdle in online shopping.

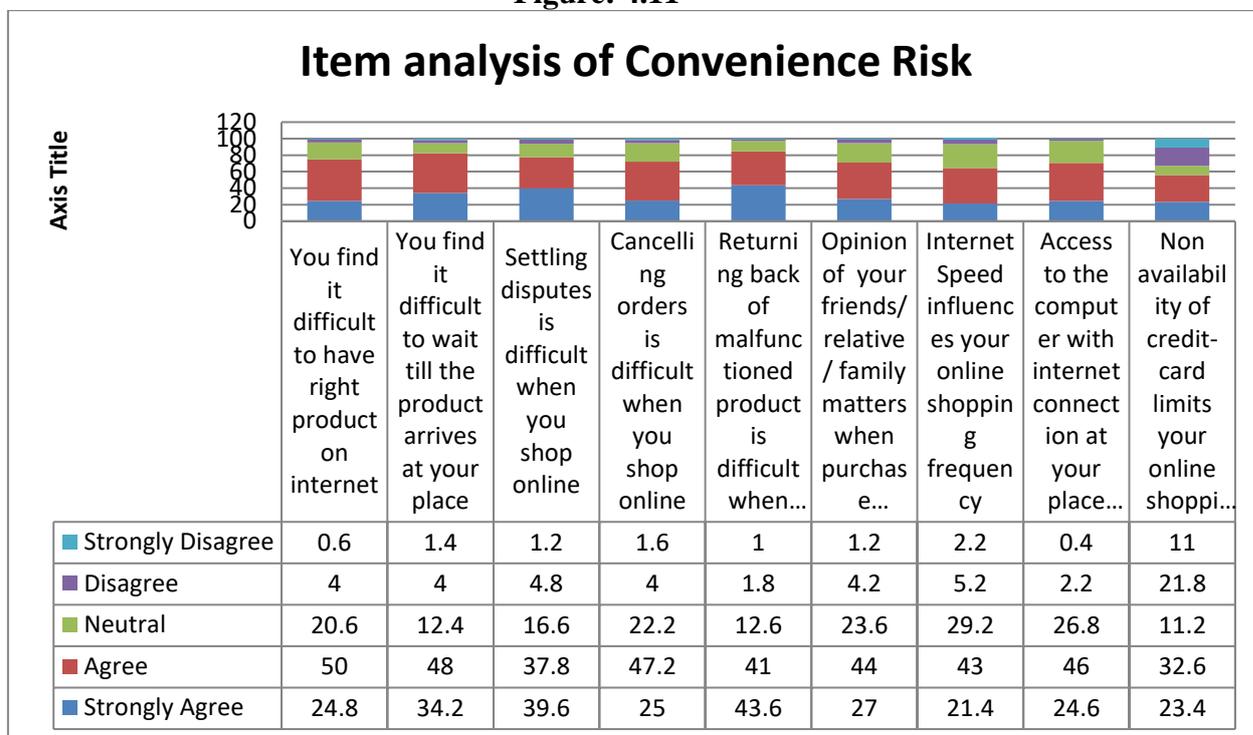
Figure: 4.10



(Source: Survey Data)

Interpretation: 75.6% of the sample respondents experienced a different product from the product ordered at the time of delivery and also found difficult judge the quality of the product virtually. Thus researcher found product risk as one of the major factors which affects inversely to the online shopping.

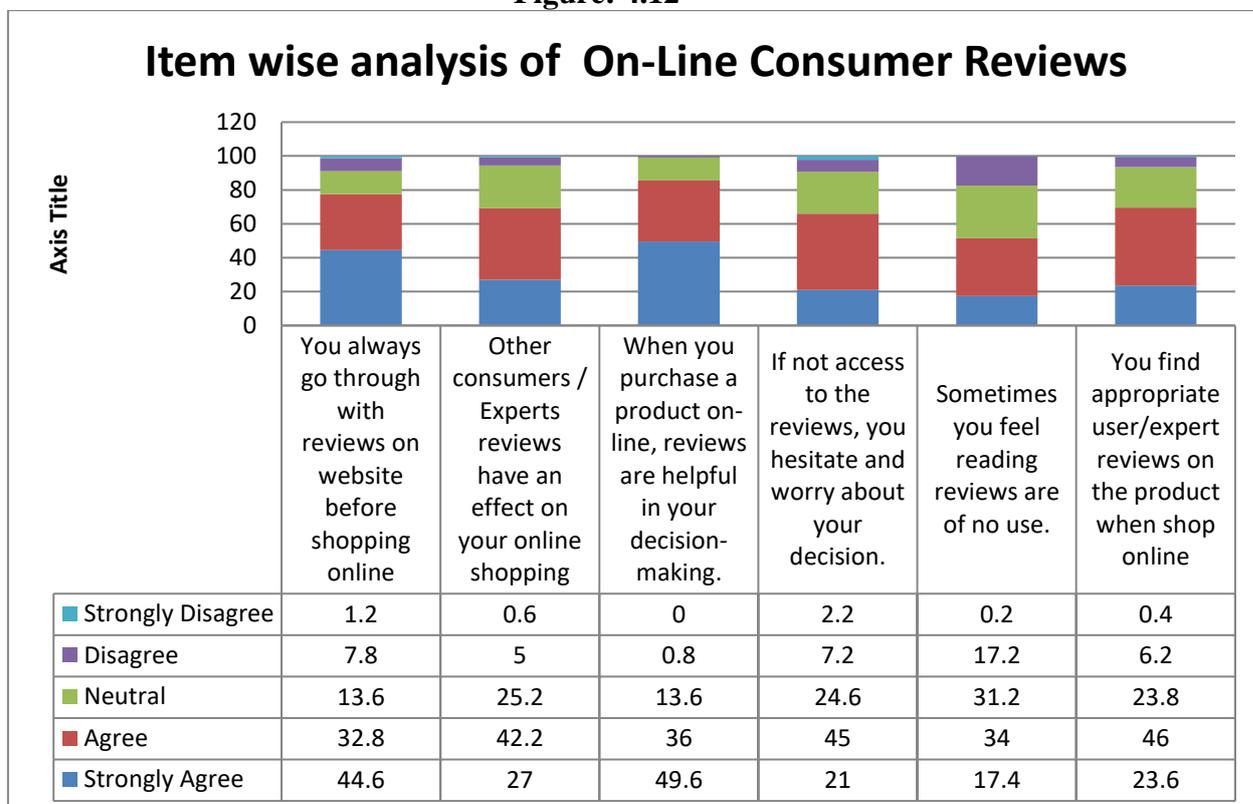
Figure: 4.11



(Source: Survey Data)

Interpretation: Above data represents opinion of sample respondents regarding Convenience risk while online shopping. 74.8% of the sample respondents found difficult to have right product on internet. 82.2% of the sample respondents found it difficult to wait till the product arrives at their place. 75.4% of the sample respondents found settling disputes difficult when shop online. 72.2% of the sample respondents reported cancelling orders difficult when they shop online. Difficulty in returning back of malfunctioned product was reported by majority of the sample respondents. Majority of the sample respondents were agreed and strongly agreed that opinion of friends, relative and family matters when purchase online, internet speed influences online shopping frequency, access to the computer with internet connection at own place affect online shopping and non availability of credit-card limits online shopping.

Figure: 4.12



(Source: Survey Data)

Interpretation: Above figure produces item wise Consumer opinion about online consumer reviews during online shopping. During the survey researcher found consumer reviews as one of the most prominent factors which have a great deal of impact on consumers buying decisions when they shop online. 77.4% of the sample respondents agree and strong agree on the fact that they prefer to go through with reviews on website before shopping online. 69.2% of the sample respondents reported that other consumers and experts reviews have an effect on their online shopping. 85.6% of the sample respondents felt that these reviews were of great help in their decision making regarding purchasing online. On the other hand, if the reviews are not available they hesitate and found themselves in dilemma regarding their choice. Many of the sample respondents found these reviews of no use since they feel that companies may play with such online reviews. However in all, the above facts established consumer online reviews significant for online shopping decisions.

4.3 Hypothesis testing through regression model and ANOVA test

To examine the study's hypotheses, Regression Analysis and ANOVA test were used to analyze the relationships between the Predictors (independent variables) and the dependent variables. The hypotheses and results are as follows:

4.3.1 Regressions Analysis of determinants of online consumer behavior toward online shopping

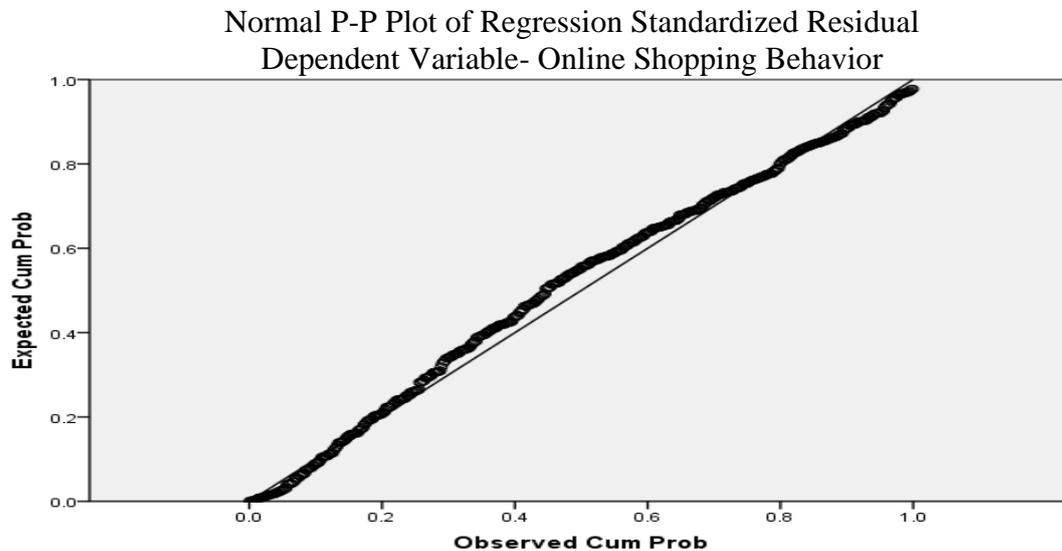
Table -5.2

Model Summary					
Model	R	R Square	Adjusted R Square	Durbin-Watson	
	0.87	.757	.607	1.875	
Predictors: (Constant), Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews					
Dependent Variable: Online Shopping Behavior (OSB)					
ANOVA					
	Sum of Squares	df	Mean Square	F	p value
Regression	57.345	8	7.168	5.502	.000
Residual	439.689	168	1.303		
Total	497.035	176			

Table-5.3

Hypothesis	Coefficients					Result of Hypothesis testing	
		Unstandardized Coefficients		Standardized Coefficients	t		p value
		B	Std. Error	Beta			
	(Constant)	6.328	.274		23.082	.000	
H ₁	Perceived Financial Risks	-.025	.109	-.011	-.229	.034*	Ho reject Significant Difference
H ₂	Product Risk	-.116	.090	-.067	-1.294	.196	Ho Accept
H ₃	Convenience Risk	-.083	.084	-.047	-.984	.326	Ho Accept
H ₄	Non-Delivery Risk	-.047	.089	-.025	-.525	.000*	Ho reject Significant Difference
H ₅	Return Policy	.006	.066	.004	.089	.929	Ho Accept
H ₆	On-Line Consumer Reviews	-.096	.070	-.067	-1.382	.018*	Ho reject Significant Difference

* Denotes significance at the 0.05 level



(Source: Survey Data)

Interpretation

Above regression modal demonstrate correlation between dependent and independent variables used in present study. Perceived Financial Risks; Product Risk; Convenience Risk; Non-Delivery Risk; Return Policy; On-Line Consumer Reviews are considered as independent variables whereas Online Shopping Behavior (OSB) is taken as dependent variable. To determine the relationship between dependent and independent variable multivariate regression and correlation statistical techniques have been used. Correlation coefficient measured value was 0.87 which shows there is a high degree of correlation between both the variables. Coefficient of determination (R^2) and Adjusted R^2 were .757 and .607 respectively which implies that selected independent variables have 75.7% impact on OSB. To determine significance of the above results ANOVA technique has been used for which the P value was found less than .05. This implies that results are significant.

Table 5.3 represents the results for above mentioned hypotheses (H1 to H6). The results showed that H1, H4 and H6 are significantly supported. Thus, Perceived fear of Financial Risk and Non-Delivery Risk has negative effect on consumers' OSB. Significant effect of on-line consumer reviews on online shopping behavior was found. The higher the perceived financial and non delivery risk, the lower attitude toward online shopping. This finding is compatible with findings of the Forsythe and Shi (2003) and Biswas and Biswas (2004). In these studies, financial risk is an important factor for not shopping online. Also the higher the probability of non-delivery of order, the lower attitude toward online shopping. It indicates that the non-delivery risk is a significant factor for affecting behavior towards shopping online. People do not tend to shop online because they are not sure whether the ordered Product will be delivered or not and lack of seriousness and efforts towards building trust by the retailers makes it a significant reason.

Results of testing the hypotheses H2, H3 and H5 indicated that effect of product risks, convenience risk and effective Return Policy on attitude toward online shopping is not significant. These findings are consistent with the findings from the previous study from Sinha (2010). This is also in contrast with the findings of the existing studies (e.g. Forsythe and Shi, 2003; Biswas and Biswas, 2004) where product and convenience risk are important significant risk factors for not shopping online. The possible reason of this

insignificance in Present study context appears to be the indifference and unwillingness of selected respondent consumers towards Results of testing the hypotheses H2, H3 and H5 indicated that product risks, convenience risk and effective Return Policy were not significant at the 0.05 level and are not supported.

4.3.2 Cross tab analysis of different factors with demographics variables affecting online shopping behavior

H7: Null Hypothesis (H₀₇): There is no significant relationship between selected demographic variable and online shopping behavior.

Alternate Hypothesis (H_{a7}): There is significant relationship between selected demographic variable and online shopping behavior.

Researcher formulated above hypothesis to analyze relationship between demographic variable (Age, Gender, occupation, education, marital status) and online shopping behavior and Kruskal Walis Test which is a non parametric test has been applied to test the same in the following section with cross tab analysis:

A. Cross tab analysis of different factors with Age of the respondents

VARIABLES	Age in years	N	Mean	SD	KRUSKAL WALIS TEST			Result of Hypothesis testing
					Chi-square	df	P VALUE	
Perceived Financial Risks	20-30	81	1.88	0.21	3.176	3	.045	Ho Reject Significant difference
	30-40	44	2.06	0.53				
	40-50	40	2.70	0.58				
	50 and above	11	1.50	0.15				
	Total	176	2.02	0.53				
Convenience Risk	20-30	81	2.42	0.86	1.905	3	.592	Ho Accept Insignificant difference
	30-40	44	2.12	0.68				
	40-50	40	2.08	0.68				
	50 and above	11	2.00	0.15				
	Total	176	2.10	0.68				
Non-Delivery Risk	20-30	81	2.17	0.68	.934	3	.817	Ho Accept Insignificant difference
	30-40	44	2.06	0.69				
	40-50	40	2.07	0.66				
	50 and above	11	2.50	0.24				
	Total	176	2.07	0.67				
Return Policy	20-30	81	2.33	0.75	1.167	3	.761	Ho Accept Insignificant difference
	30-40	44	2.05	0.61				
	40-50	40	2.10	0.65				
	50 and above	11	2.00	0.46				
	Total	176	2.08	0.64				
On-Line Consumer Reviews Perceived Financial Risks	20-30	81	2.33	1.03	1.274	3	.735	Ho Accept Insignificant difference
	30-40	44	2.25	0.84				
	40-50	40	2.17	0.85				
	50 and above	11	2.00	0.48				
	Total	176	2.20	0.85				

Product Risk	20-30	81	2.50	0.55	1.610	3	.657	Ho Accept Insignificant difference
	30-40	44	2.20	0.82				
	40-50	40	2.26	0.82				
	50 and above	11	2.00	0.38				
	Total	176	2.24	0.82				

Interpretation: Above statistical analysis revealed that there is a significant relationship between financial risks perceived by different Age groups has impact on their online shopping behavior. P value for the variable “perceived financial risk” was found .045 which was less than the value .05. On analyzing the mean score regarding financial risk perceived by different age group respondent, researcher came to know that perception regarding financial risk of age group between 50 and above was highest among all age groups. This indicates people from high age groups are more cautious than lower group regarding financial risk involved in online shopping.

B. Cross tab analysis of different factors with marital status of the respondents:

VARIABLES	Marital status	N	Mean	SD	KRUSKAL WALIS TEST			Result of Hypothesis testing
					Chi-square	df	P VALUE	
Perceived Financial Risks	Married	81	1.9750	.71151	1.359	2	.507	Ho Accept Insignificant difference
	Unmarried	84	2.0184	.52398				
	Others	11	2.3750	.88388				
	Total	176	2.0190	.52839				
Product Risk	Married	81	2.3500	1.05541	1.486	2	.476	Ho Accept Insignificant difference
	Unmarried	84	2.0953	.67031				
	Others	11	2.7500	1.06066				
	Total	176	2.1030	.68104				
Convenience Risk	Married	81	2.4000	.96609	6.275	2	.043	Ho Reject significant difference
	Unmarried	84	2.0656	.65885				
	Others	11	1.0000	.00000				
	Total	176	2.0680	.66878				
Non-Delivery Risk	Married	81	2.2500	.71686	.749	2	.688	Ho Accept Insignificant difference
	Unmarried	84	2.0799	.63502				
	Others	11	2.2500	.35355				
	Total	176	2.0840	.63541				

Return Policy	Married	81	1.9000	.56765	2.726	2	.256	Ho Accept Insignificant difference
	Unmarried	84	2.2070	.85270				
	Others	11	1.5000	.70711				
	Total	176	2.1980	.84867				
On-Line Consumer Reviews	Married	81	2.3000	1.15950	2.321	2	.313	Ho Accept Insignificant difference
	Unmarried	84	2.2336	.80981				
	Others	11	3.0000	.00000				
	Total	176	2.2380	.81651				

Interpretation: Above statistical analysis revealed that there is a significant relationship between marital status and convenience risks and it has impact on online shopping behavior. P value for the variable “convenience risk” was found .043 which was less than the value .05. On analyzing the mean score regarding convenience risk perceived by married respondents, researcher came to know that they found it difficult to identify right product on internet. Settling disputes and cancelling orders were the other concerns.

C. Cross tab analysis of different factors with Gender of the respondents:

VARIABLES	Gender	N	Mean	SD	KRUSKAL WALIS TEST			Result of Hypothesis testing
					Chi-square	df	P VALUE	
Perceived Financial Risks	Male	97	1.9750	.71151	1.359	2	.507	Ho Accept Insignificant difference
	Female	76	2.0184	.52398				
	Others	3	2.3750	.88388				
	Total	176	2.0190	.52839				
Product Risk	Male	97	2.3500	1.05541	1.486	2	.476	Ho Accept Insignificant difference
	Female	76	2.0953	.67031				
	Others	3	2.7500	1.06066				
	Total	176	2.1030	.68104				
Convenience Risk	Male	97	2.4000	.96609	6.275	2	.033	Ho Reject significant difference
	Female	76	2.0656	.65885				
	Others	3	1.0000	.00000				
	Total	176	2.0680	.66878				
Non-Delivery Risk	Male	97	2.2500	.71686	.749	2	.688	Ho Accept Insignificant

	Female	76	2.0799	.63502				difference
	Others	3	2.2500	.35355				
	Total	176	2.0840	.63541				
Return Policy	Male	97	1.9000	.56765	2.726	2	.256	Ho Accept Insignificant difference
	Female	76	2.2070	.85270				
	Others	3	1.5000	.70711				
	Total	176	2.1980	.84867				
On-Line Consumer Reviews	Male	97	2.3000	1.15950	2.321	2	.313	Ho Accept Insignificant difference
	Female	76	2.2336	.80981				
	Others	3	3.0000	.00000				
	Total	176	2.2380	.81651				

Interpretation: Above statistical analysis revealed that there is a significant relationship between gender and convenience risks and it has impact on online shopping behavior. P value for the variable “convenience risk” was found .033 which was less than the value .05. On analyzing the mean score regarding convenience risk perceived by male and female respondents, researcher came to know that male and female have different opinions regarding online shopping convenience.

D. Cross tab analysis of different factors with Education of the respondents

VARIABLES	Education	N	Mean	SD	KRUSKAL WALIS TEST			Result of Hypothesis testing
					Chi-square	df	P VALUE	
Perceived Financial Risks	Not Graduate	37	1.88	0.21	3.176	3	.365	Ho Accept Insignificant difference
	Graduate	86	2.06	0.53				
	Post Graduate	36	2.00	0.53				
	Others	17	1.50	0.58				
	Total	176	2.02	0.53				
Convenience Risk	Not Graduate	37	2.42	0.86	1.905	3	.592	Ho Accept Insignificant difference
	Graduate	86	2.12	0.68				
	Post Graduate	36	2.08	0.68				
	Others	17	2.00	0.53				
	Total	176	2.10	0.68				
Non-Delivery Risk	Not Graduate	37	2.17	0.68	.934	3	.817	Ho Accept Insignificant difference
	Graduate	86	2.06	0.69				
	Post Graduate	36	2.07	0.66				
	Others	17	2.50	0.57				
	Total	176	2.07	0.67				

Return Policy	Not Graduate	37	2.33	0.75	1.167	3	.761	Ho Accept Insignificant difference
	Graduate	86	2.05	0.61				
	Post Graduate	36	2.10	0.65				
	Others	17	2.00	0.57				
	Total	176	2.08	0.64				
On-Line Consumer Reviews Perceived Financial Risks	Not Graduate	37	2.33	1.03	1.274	3	.735	Ho Accept Insignificant difference
	Graduate	86	2.25	0.84				
	Post Graduate	36	2.17	0.85				
	Others	17	2.00	0.59				
	Total	176	2.20	0.85				
Product Risk	Not Graduate	37	2.50	0.55	1.610	3	.657	Ho Accept Insignificant difference
	Graduate	86	2.20	0.82				
	Post Graduate	36	2.26	0.82				
	Others	17	2.00	0.51				
	Total	176	2.24	0.82				

Interpretation: Above table indicates the P value for the variable all selected variables was found more than the value .05. On analyzing the mean score researcher came to know that there is no significant impact of education level on online shopping behavior.

E. Cross tab analysis of different factors with Occupation of the respondents

VARIABLES	Occupation	N	Mean	SD	KRUSKAL WALIS TEST			Result of Hypothesis testing
					Chi-square	df	P VALUE	
Perceived Financial Risks	Salaried	58	1.88	0.21	3.176	3	.365	Ho Accept Insignificant difference
	Business and Self-employed	52	2.06	0.53				
	Student	44	2.00	0.53				
	Retired and others	22	1.50	0.51				
	Total	176	2.02	0.53				
Convenience Risk	Salaried	58	2.42	0.86	1.905	3	.592	Ho Accept Insignificant difference
	Business and Self-employed	52	2.12	0.68				
	Student	44	2.08	0.68				
	Retired and others	22	2.00	0.59				
	Total	176	2.10	0.68				
Non-Delivery Risk	Salaried	58	2.17	0.68	.934	3	.817	Ho Accept Insignificant difference
	Business and Self-employed	52	2.06	0.69				
	Student	44	2.07	0.66				
	Retired and others	22	2.50	0.57				
	Total	176	2.07	0.67				

Return Policy	Salaried	58	2.33	0.75	1.167	3	.761	Ho Accept Insignificant difference
	Business and Self-employed	52	2.05	0.61				
	Student	44	2.10	0.65				
	Retired and others	22	2.00	0.51				
	Total	176	2.08	0.64				
On-Line Consumer Reviews Perceived Financial Risks	Salaried	58	2.33	1.03	1.274	3	.735	Ho Accept Insignificant difference
	Business and Self-employed	52	2.25	0.84				
	Student	44	2.17	0.85				
	Retired and others	22	2.00	0.51				
	Total	176	2.20	0.85				
Product Risk	Salaried	58	2.50	0.55	1.610	3	.657	Ho Accept Insignificant difference
	Business and Self-employed	52	2.20	0.82				
	Student	44	2.26	0.82				
	Retired and others	22	2.00	0.51				
	Total	176	2.24	0.82				

Interpretation: Above table indicates the P value for the variable all selected variables was found more than the value .05. On analyzing the mean score researcher came to know that there is no significant impact of occupation on online shopping behavior.

5. Conclusion and Suggestions

Researcher evaluated few factors affecting online consumer shopping behavior. A conceptual model was framed to measure the effects of variables on online consumer shopping behavior for which statistical analysis has been done with the help of regression analysis and other non-parametric tests. Through which “perceived financial risk” and non-delivery risk were found negatively correlated with online shopping behavior. On the other hand, online consumer reviews were found most significant factors for increased online shopping. It implies that websites should be developed as safer and delivery of original products should be assured within the time frame. Also, referrals have positive effect on shopping behavior. This means the more people suggest e-buying to each other, the more this buying method will be popular among people. This makes necessary the use of word of mouth marketing for retailers. This means that marketing specialists should target this society in their marketing strategy formulation for better effectiveness of their marketing program.

The present study reveals that perceived financial risk, ease of use, consumer’s online reviews affects online shopping behavior. On the basis of findings following are the some suggestions for the better environment for online shopping:

- Online retailers should try and reduce perceived financial risks as it was revealed the most critical factor which has deep negative impact on online shopping. This can be achieved through giving money-back-guarantee, offering quality merchandise, secured online transactions and improved customer service.

- Though many of the online retailers are providing cash on delivery facility (COD) to their valued customers, still an effective mechanism is yet to be developed. Hence it is suggested that online retailers should give more emphasis on Cash on Delivery as a mechanism to reduce perceived product delivery risks and perceived product quality risks.
- A sound rating system of different products offering on this online platform should be developed where consumers may rate the products in order to reduce perceived risks significantly.
- The retailer should also focus on better packaging that can reduce product tampering.
- Retailers should also focus on aspects like delivery of right products at right time at customer's doorsteps to prevent mismatch of merchandise ordered and merchandise delivered.
- To make online customers more aware about safety of transactions, reliability of products, ease of delivery, product quality and cash back guarantee, retailers may convey or highlight through mass media which in turn will improve web traffic to an online retail store.
- Retailers should provide customers with sufficient information about products. Customers should make available with the features so that they can compare the products on various factors such as features, price, etc., would help customers in making online buying decision.
- Consumers should be encouraged to opt in for receiving product related e-mails in order to make them updated.
- Better customer service with quick response to customer queries and better handling of customer complaints would improve the image of online retailer.
- Based on the results and findings of this study, retail companies should start taking measures to eliminate risk factor and build trust in online retail shopping. The results also suggest that after sales operations like, dispute settling and delivery should be carried out promptly and quickly so that consumer would build faith in the system. During the process of purchasing, online agents can help customers and simplify the purchasing procedure to give a feeling of friendliness of salesman or demonstrate how to purchase with clear text, images or examples.

Finally, based on the study's results that consumers were worried and unsure about delivery of their orders (non-delivery risk), online retailers should provide the insurance for shoppers that they ordered items and make sure that the products will definitely be delivered to them. They can achieve this goal by providing certain certificate from authorities and governmental organizations that allow them to sell goods from internet and assure customers that this online retailer is rendering the job legally, so customers will buy from them with more confident and will not be worry about the delivery of their orders anymore.

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A Zoned Node Interconnection for the Optimisation and Implementation of Two Adaptive Routing Algorithms for XGFT Networks

Ramesh .P, &Manikandan.S*

Abstract

Fat tree topologies have been extensively used as interconnection networks for high performance computing, cluster and data centre systems, with their most recent variants able to fairly extend and scale to accommodate higher processing power. While each progressive and evolved fat-tree topology includes some extra advancement, these networks do not fully address all the issues of large scale HPC. We propose a topology called Zoned-Fat tree (Z-Fat tree,) which is a further extension to the fat trees. The extension relates to the provision of extra degree of connectivity to utilize the extra ports per switches (routing nodes), that are, in some cases, not utilized by the architectural constraints of other variants of fat trees, and hence increases the bisection bandwidth, reduces the latency and supplies additional paths for fault tolerance. To support and profit from the extra links, we propose an adaptive low latency routing for up traffic which is based on a series of leading direction bits predefined at the source; furthermore we suggest a deterministic routing by implementing a dynamic round robin algorithm that overtakes D-mod-K in some cases and guarantees the utilization of all the extra links. We also propose a fault tolerance algorithm, named recoil-and-reroute which makes use of the extra links to ensure higher message delivery even in the presence of faulty links and switches.

Keywords: dynamic round robin algorithm, an adaptive low latency routing

1. Introduction

The next generation of supercomputers will face more challenges to tackle far more complex and larger programming problems and open new horizons in the scientific, engineering and business disciplines. Such high expectations will put more burdens on the network interconnections to satisfy a follow up communication performance and power consumption. Indeed an increase in the computational speed of processors can lead to extreme power constrains. Interconnecting a larger number of chips while keeping the overall cost under budget and delivering the required performance are a trade-off. A need to interconnect those high speed processing elements in the best manner possible is a challenging task. While the technology for higher speed processors keeps advancing, the research on the interconnection networks of high performance computing lags behind and shows trifling contributions Fat tree topologies , with their simplistic properties and ability to scale, are deemed to be the most popular solutions for computing clusters, data centres and HPC. They can be seen as universal networks that can emulate any other topology deploying the same amount of resources with slight reduction in efficiency. The high path diversity in fat trees, with its fault tolerant property, plays a critical role in the overall performance of the communication networks. One interesting approach is hybrid networks

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which involve the incorporation of fat tree design as building blocks for nodes hosting many processors for large scale parallel systems such as in Blue Gene IBM, Dragonfly X-Mesh, and Torus. Newer technologies on optical networks and photonic switches are emerging. These technologies Fat trees also experience some known issues such as the bottleneck caused from the limited availability of paths. In some cases only a single path exists from each routing node in the downward directions. This characteristic is also exhibited by some slimmed fat trees in general that are recently being the candidates for current parallel machines due to their reduced cost. have demonstrated potential to attain higher bandwidth and effective In this paper, like other works [14], we increase the number of links that are not normally part of the XGFT semantics to provide a further extension and generalization to fat tree topologies. The aim behind these extensions is to address the issues of scalability experienced by k-ary n-tree networks, fault tolerance and routing to achieve lower latency and higher bandwidth.

2. Literature Review

Considerable interests have been devoted to mesh, torus and fat tree topologies for network on chip design to support high performance computing. Many variants of the mesh and torus networks such as X-mesh have been proposed over the years. In addition, fat tree topology is well known for its existence in data centres and clustering systems. X-mesh topology is based on mesh structure with additional diagonal edges to reduce the average diameter of the topology. According to the authors, X-mesh performs better than torus in terms of network latency for uniform traffic patterns, but degrades in performance for hotspot traffic. Its main problem compared to fat tree networks is the long diameter as the number of processors increases. A successor of Mesh topology is WK-recursive mesh and WKpyramids networks. Similarly to fat trees, they have a smaller diameter and a higher degree of scalability compared to the traditional mesh and pyramid networks. However, these topologies still incur the high traffic issues encountered by the mesh topology and exhibit higher communication cost compared to fat trees. Symmetric tori connected torus (STTN) is a variant of torus with lower interconnection network cost compared to traditional torus and mesh. The bisection width of STTN is larger than other torus and mesh interconnection networks, implying an increase in extra chip wires will be required for the physical implementation of STTN; therefore, inevitably incurring higher cost and power consumption. Another popular variant of torus is the torus embedded hypercube. An approach which can reach better scalability and decrease the network diameter. For this solution to work, the size of hypercube is required to stay constant at all times to avoid node degree increase. However, with the emerging technology, the demands for more scalable systems do not favour this approach. On the other hand, torus has a constant node degree therefore can support highly scalable architectures at the cost of an increase in diameter inducing hence higher latencies, unlike fat trees. Torus and 2D meshes are usually there is still a large scope of improvement for fat trees to meet the requirements of high performance computing and large scale data centres. XGFT can increase the number of paths at the expenses of more routing elements, which increases the overall complexity of the network. Quasi fat tree addresses this problem by also suggesting additional ports to the XGFT. However, these links extend beyond the subtree structure and therefore require complex routing over the XGFT. Our extended links proposed in this paper are confined within the subtrees (zones), preserving hence the simplicity of the routing of the XGFT.

3. Related Work

3.1 Approximate Shortest-Path Trees Fault-Tolerant:

To enrich a single-source shortest-path tree (SPT) of G with a sparse set of auxiliary edges selected from E , in order to create a structure which tolerates effectively a path failure in the SPT. This consists of a simultaneous fault of a set F of at most f adjacent edges along a shortest path emanating from the source, and it is recognized as one of the most frequent disruption in an SPT. We show that, for any integer parameter $k \geq 1$, it is possible to provide a very sparse (i.e., of size $O(kn \cdot f^{1+1/k})$) auxiliary structure that carefully approximates (i.e., within a stretch factor of $(2k - 1)(2|F| + 1)$) the true shortest paths from the source during the lifetime of the failure. Moreover, we show that our construction can be further refined to get a stretch factor of 3 and a size of $O(n \log n)$ for the special case $f = 2$, and that it can be converted into a very efficient approximate-distance sensitivity oracle, that allows to quickly (even in optimal time, if $k = 1$) reconstruct the shortest paths (w.r.t. our structure) from the source after a path failure, thus permitting to perform promptly the needed rerouting operations. Our structure compares favorably with previous known solutions, as we discuss in the paper, and moreover it is also very effective in practice, as we assess through a large set of experiments. Ult-tolerant against a given number of simultaneous component failures, by adding to it a set of suitably selected edges from the underlying graph, so that the resulting structure will remain connected w.r.t. the source. In other words, the selected edges can be used to build up alternative paths from the root, each one of them in replacement of a corresponding original shortest path which was affected by the failure. However, if these paths are constrained to be shortest, then it can be easily seen that for a non-negatively real weighted and undirected graph of n nodes and m edges, this may require as much as $\Theta(m)$ additional edges, also in the case in which $m = \Theta(n^2)$. In other words, the set-up costs of the strengthened network may become unaffordable comes into play as soon as a component undergoes a failure.

3.2 Order/Radix Problem: Towards Low End-to-End Latency Interconnection Networks

We introduce a novel graph called a host-switch graph, which consists of host vertices and switch vertices. Using host-switch graphs, we formulate a graph problem called an order/radix problem (ORP) for designing low end-to-end latency interconnection networks. Our focus is on reducing the host-to host average shortest path length (h-ASPL), since the shortest path length between hosts in a host-switch graph corresponds to the end-to-end latency of a network. We hence define ORP as follows: given order (the number of hosts) and radix (the number of ports per switch), find a host-switch graph with the minimum h-ASPL. We demonstrate that the optimal number of switches can mathematically be predicted. On the basis of the prediction, we carry out a randomized algorithm to find a host-switch graph with the minimum h-ASPL. Interestingly, our solutions include a host-switch graph such that switches have the different number of hosts. We then apply host-switch graphs to interconnection networks and evaluate them practically. As compared with the three conventional interconnection networks (the torus, the dragonfly, and the fat-tree), we demonstrate that our networks provide higher performance while the number of switches can decrease.

4. Existing System

The cluster and data center systems, with their most recent variants able to fairly extend and scale to accommodate higher processing power. While each progressive and evolved

fat-tree topology includes some extra advancement, these networks do not fully address all the issues of large scale HPC. The possibility to interconnect fat tree topologies by photonic routers. Fat trees also experience some known issues such as the bottleneck caused from the limited availability of paths. In some cases only a single path exists from each routing node in the downward directions. Addressed the issues of optimization, on how to generate optimal fat tree topologies that exhibit minimum complexity.

4.1 Disadvantages

Computational speed

Low speed processing

Latency

Not fully address

5. Proposed System

Propose a topology called Zoned-Fat tree (Z-Fat tree,) which is a further extension to the fat trees. The extension relates to the provision of extra degree of connectivity to utilize the extra ports per switches (routing nodes). It is not utilized by the architectural constraints of other variants of fat trees, and hence increases the bisection bandwidth, reduces the latency and supplies additional paths for fault tolerance to support and profit from the extra links.

Propose an adaptive low latency routing for up traffic by implementing a dynamic round robin algorithm that overtakes D-mod-K in some cases and guarantees the utilization of all the extra links. Propose a fault tolerance algorithm, named recoil-and-reroute which makes use of the extra links to ensure higher message delivery even in the presence of faulty links and switches.

Advantages

Low latency

Fault tolerance

Higher message delivery

Increases the bandwidth

5.1 Architecture Diagram

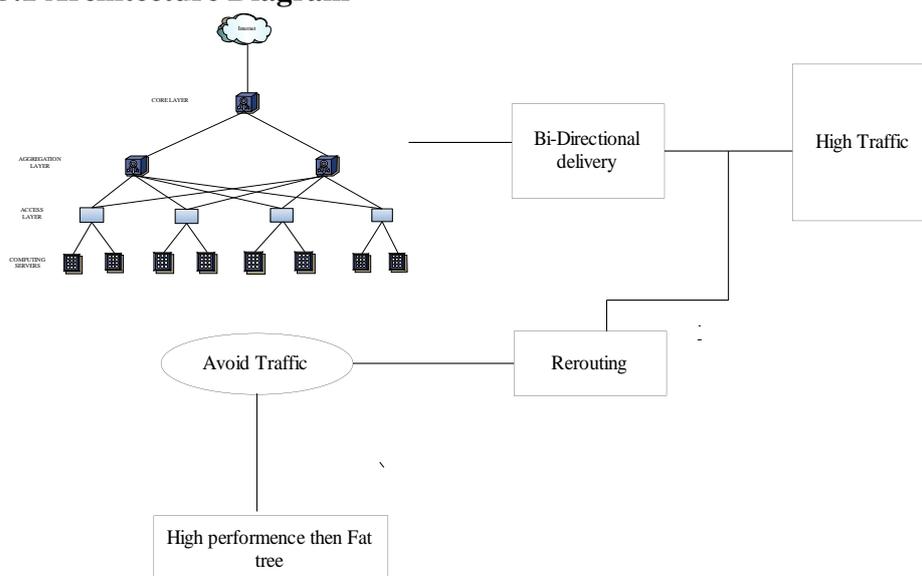


Fig.1 System Architecture diagram

5.2 System Modules

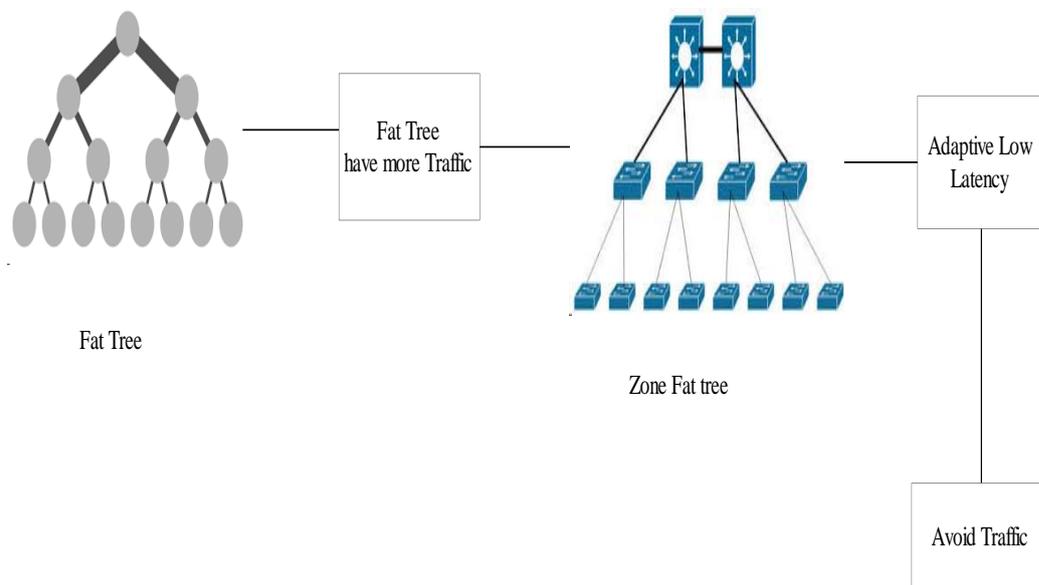
The system comprises of the following modules which include,

- Extension of fat trees as zoned fat tree.
- Avoid Traffic.
- High Message Delivery.
- Handling Failures.

5.2.1 Extension of fat trees as zoned fat tree:

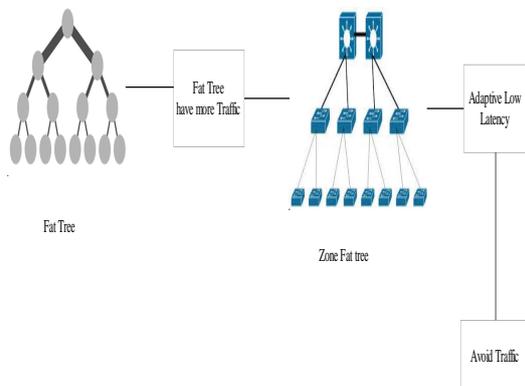
- The extension relates to the provision of extra degree of connectivity to utilize the extra ports per switches (routing nodes), that are, in some cases, not utilized by the architectural constraints of other variants of fat trees.

And increases the bisection bandwidth, reduces the latency and supplies additional paths for fault tolerance.



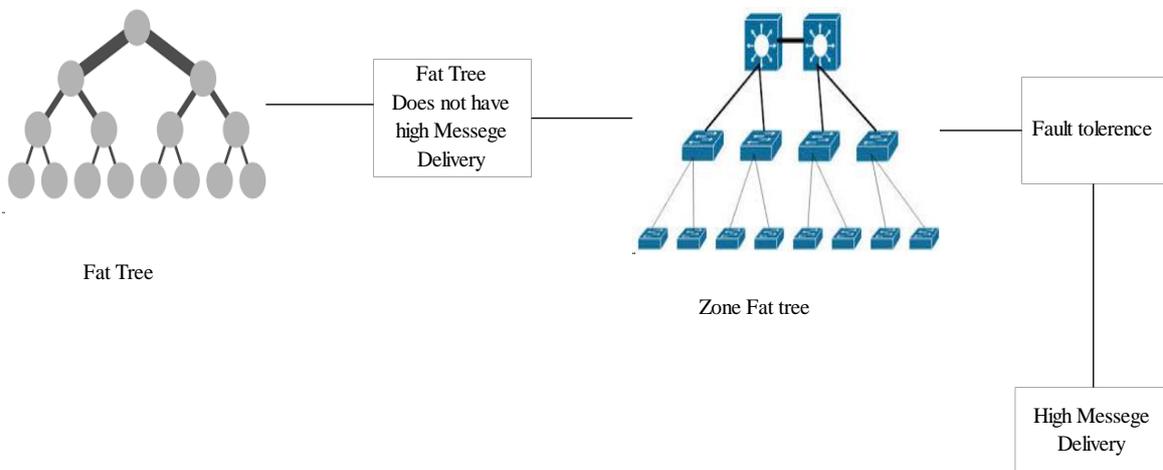
5.2.2 Avoid Traffic

- Adaptive low latency routing for up traffic.
- We suggest a deterministic routing by implementing a dynamic round robin algorithm that overtakes D-mod-K in some cases and guarantees the utilization of all the extra links.



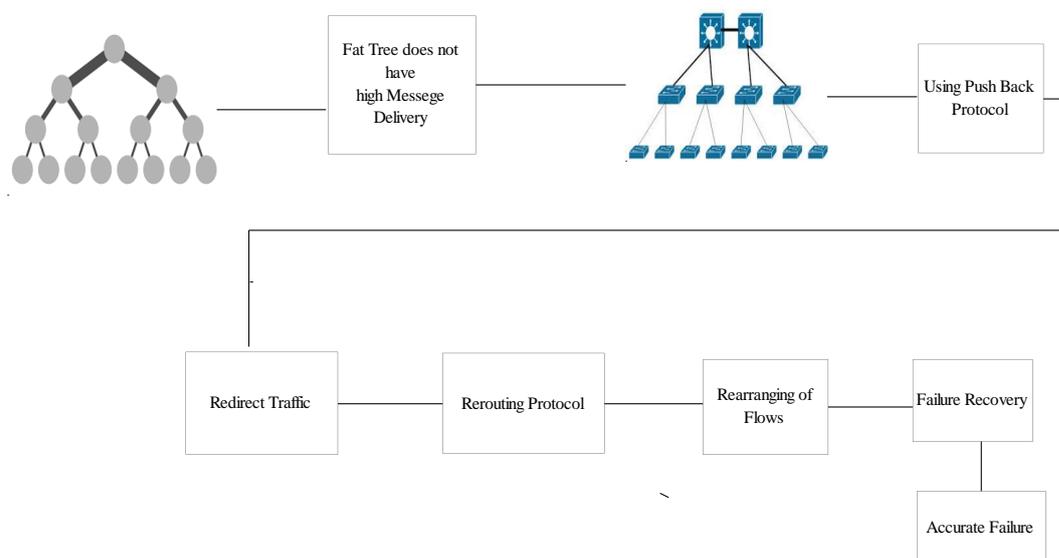
5.2.3 High Message Delivery

- Fault tolerance algorithm, named recoil-and-reroute which makes use of the extra links to ensure higher message delivery
- Adaptive routing scheme is generally preferred as in the case of network contentions, in the case of faults or changes, the message can still reach its destination successfully.
- However, its main kerb is the Inability to perform in-order delivery of messages. Similarly to TCP protocol, at the expense of extra buffering and control flow, this can be solved by embedding a sequence number in every fragment of the original message sent.
- At the destination processing node, the network interface stores them in the reorder buffer and finally when all the fragments have arrived, it orders them into a complete message and delivers the message to the Node.



5.2.4 Handling Failures

- The fail over protocol consists of three stages that operate on increasing timescales. When a switch detects a failure in one of its links, it immediately begins using local rerouting to reroute the very next packet.
- The local rerouting inflates paths as well as increases local congestion, the switch initiates a pushback protocol that causes upstream switches to redirect traffic to resume using shortest paths.
- And finally, to deal with long-term failures that create a structural imbalance in the network, a centralized rerouting protocol determines an efficient global rearrangement of flows. In addition, the key to fast failure recovery is rapid and accurate failure detection, which is discussed at the end of this section.



6. Conclusion

Introduced another generalization of the fat tree we call in this paper Z-Fat tree. The main feature of this architecture is the provision of implicit and explicit additional links as degree of connectivity to the semantics of the XGFT. The extra links are within the confinement of the sub trees or zones, and therefore preserve the properties of the fat trees, without major changes. This supplement increases the bisection bandwidth, utilizes the unused ports to create equal radix topologies and ameliorates the bandwidth of the slimmed fat trees without adding complexity. It also provides multiple paths between a source and destination pair. We have shown that additional links allow the Z-Fat tree to perform well, both with adaptive and deterministic routing under several communication patterns. The deterministic dynamic round robin algorithm we suggested in this paper shows improvement as a whole over D%K routing for topologies where load balancing out-weights the concentration of the traffic. It remains to appreciate that D%K routing algorithm also performs well, for full-bandwidth and regular fat trees. We have also proposed an adaptive single bit source routing, DBSA, that works for all classes of fat trees by introducing a minimum latency to find the LCL.

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Structured Representations in a Content Based Image Retrieval Context

Manikandan.P & Christopher.P*

Abstract

Here, we propose an automatic system to annotate and retrieve images. We assume that regions in an image can be described using a vocabulary of blobs. Blobs are generated from image features using clustering. Features are locally extracted on regions to capture Color, Texture and Shape information. Regions are processed by an efficient segmentation algorithm. Images are structured into a region adjacency graph to consider spatial relationships between regions. This representation is used to perform a similarity search into an image set. Hence, the user can express his need by giving a query image, and thereafter receiving as a result all similar images. Our graph based approach is benchmarked to conventional Bag of Words methods. Results tend to reveal a good behavior in classification of our graph based solution on two publicly available databases. Experiments illustrate that a structural approach requires a smaller vocabulary size to reach its best performance.

Keywords:- Color, Texture, Retrieve images.

1. Introduction

Content-based image retrieval (CBIR), also known as query by image content (QBIC) and content-based visual information retrieval (CBVIR) is the application of computer vision to the image retrieval problem, that is, the problem of searching for digital images in large databases."Content-based" means that the search will analyse the actual contents of the image. The term 'content' in this context might refer colors, shapes, textures, or any other information that can be derived from the image itself. Without the ability to examine image content, searches must rely on metadata such as captions or keywords. Such metadata must be generated by a human and stored alongside each image in the database.

Problems with traditional methods of image indexing have led to the rise of interest in techniques for retrieving images on the basis of automatically-derived features such as color, texture and shape – a technology now generally referred to as Content-Based Image Retrieval (CBIR). However, the technology still lacks maturity, and is not yet being used on a significant scale. In the absence of hard evidence on the effectiveness of CBIR techniques in practice, opinion is still sharply divided about their usefulness in handling real-life queries in large and diverse image collections. The concepts which are presently used for CBIR system are all under research. Content-based retrieval systems utilize measures that are based on low-level attributes of the image itself, including color histograms, color composition, and texture. State-of-the-art research focuses on more powerful measures that can find regions of an image corresponding to known objects that users wish to retrieve.

The currently used Content-Based Image Retrieval techniques retrieves stored images from a collection of given images by comparing features automatically extracted from the

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images themselves. The most common features used are mathematical measures of color, texture or shape. A typical system allows users to formulate queries by submitting an example of the type of image being sought, though some offer alternatives such as selection from a palette or sketch input. The system then identifies those stored images whose feature values match those of the query most closely, and displays thumbnails of these images.

We have implemented the CBIR system which takes into consideration the low level features of image which is more comprehensive when compared to high level features and it also gives user a higher level of retrieval. We have divided an Image into two very basic categories of color and grayscale and used different features vector for similarity comparison and retrieval. We have used columnar mean, diagonal mean and histogram for grayscale and RGB values and Euclidean methods for color image. User always wants a friendly environment so that they can easily and effectively use the system without actually going into the finer details of the working. So, to create such a user friendly platform for the system we have designed a Graphic User Interface where user can actually select the method which they want to be used for the image retrieval and that will give them an option of using different method if the result is not as per their requirement.

Users needing to retrieve images from a collection come from a variety of domains, including crime prevention, medicine, architecture, fashion and publishing. Remarkably little has yet been published on the way such users search for and use images, though attempts are being made to categorize users' behavior in the hope that this will enable their needs to be better met in the future. Attempts are also going on integrating the search for all kind of images and combining all above mentioned feature vectors for comparison and retrieval so as to achieve the best possible efficiency.

2. Existing System

Iterative retrieval methods requires high computation energy and consumes more time. Adjusting the disjunctive queries causes the expensive search cost and the results cannot escape from the restricted range (clusters) that the users are able to specify. Probability of retrieving exact image will be very low. This becomes impractical and inefficient in real applications. High-priced manual annotation cost is prohibitive in coping with a large-scale data set.

3. Proposed System

Proposed an automatic system to annotate and retrieve images. By assuming that regions in an image can be described using a vocabulary of blobs. Blobs are generated from image features using clustering. Features are locally extracted on regions to capture Color, Texture and Shape information. Regions are processed by an efficient segmentation algorithm. Images are structured into a region adjacency graph to consider spatial relationships between regions. This representation is used to perform a similarity search into an image set. Hence, the user can express his need by giving a query image, and thereafter receiving as a result all similar images. Our graph based approach is benchmarked to conventional Bag of Words methods.

4. Advantages of Proposed System

CBIR systems were developed to search databases based on image color, texture, and shape properties. Another solution for enhancing the accuracy of image retrieval is moving the query point toward the contour of the user's preference in feature space. The main

feature of NPRF is to efficiently optimize the retrieval quality of interactive CBIR. The search procedure does not stop unless the user is satisfied with the retrieval results.

5. Problem Description

The earliest use of the term content-based image retrieval in the literature seems to have been by, to describe his experiments into automatic retrieval of images from a database by color and shape feature. The term has since been widely used to describe the process of retrieving desired images from a large collection on the basis of features (such as colour, texture and shape) that can be automatically extracted from the images themselves. The features used for retrieval can be either primitive or semantic, but the extraction process must be predominantly automatic. Retrieval of images by manually-assigned keywords is definitely not CBIR as the term is generally understood – even if the keywords describe image content.

CBIR differs from classical information retrieval in that image databases are essentially unstructured, since digitized images consist purely of arrays of pixel intensities, with no inherent meaning. One of the key issues with any kind of image processing is the need to extract useful information from the raw data (such as recognizing the presence of particular shapes or textures) before any kind of reasoning about the image's contents is possible. Image databases thus differ fundamentally from text databases, where the raw material (words stored as ASCII character strings) has already been logically structured by the author. There is no equivalent of level 1 retrieval in a text database.

CBIR draws many of its methods from the field of image processing and computer vision, and is regarded by some as a subset of that field. It differs from these fields principally through its emphasis on the retrieval of images with desired characteristics from a collection of significant size. Image processing covers a much wider field, including image enhancement, compression, transmission, and interpretation. While there are grey areas (such as object recognition by feature analysis), the distinction between mainstream image analysis and CBIR is usually fairly clear-cut. An example may make this clear. Many police forces now use automatic face recognition systems. Such systems may be used in one of two ways. Firstly, the image in front of the camera may be compared with a single individual's database record to verify his or her identity. In this case, only two images are matched, a process few observers would call CBIR. Secondly, the entire database may be searched to find the most closely matching images. This is a genuine example of CBIR.

6. Modules

1. Search Engine Interface.
2. BLOB Extraction.
 - a. Color Retrieval
 - b. Shape Retrieval
 - c. Texture Retrieval
3. Scale-Invariant Feature Transform.
4. Performance Evaluation
5. Reports

6.1 Search Engine Interface

The job of the search user interface is to aid users in the expression of their information needs, in the formulation of their queries, in the understanding of their search results, and in keeping track of the progress of their information seeking efforts. Search is a means towards some other end, rather than a goal in itself. When a person is looking for

information, they are usually engaged in some larger task, and do not want their flow of thought interrupted by an intrusive interface.

Related to the first point, search is a mentally intensive task. When a person reads text, they are focused on that task; it is not possible to read and to think about something else at the same time. Thus, the fewer distractions while reading, the more usable the interface.

Since nearly everyone who uses the Web uses search, the interface design must be understandable and appealing to a wide variety of users of all ages, cultures and backgrounds, applied to an enormous variety of information needs.

6.2BLOB Extraction

6.2.1Blob

Blob is a region of a digital image in which some properties are constant or vary within a prescribed range of values; all the points in a blob can be considered in some sense to be similar to each other. Blob was detected and extracted by using Lindeberg's watershed-based grey-level blob detection algorithm. That includes

- Color Retrieval
- Shape Retrieval
- Texture Retrieval

6.2.2Color retrieval

Methods for retrieving images on the basis of colour similarity, each image added to the collection is analysed to compute a colour histogram which shows the proportion of pixels of each colour within the image. The colour histogram for each image is then stored in the database. At search time, the user can either specify the desired proportion of each colour (75% olive green and 25% red, for example), or submit an example image from which a colour histogram is calculated. Either way, the matching process then retrieves those images whose colour histograms match those of the query most closely

6.2.3Texture retrieval

The ability to retrieve images on the basis of texture similarity may not seem very useful. But the ability to match on texture similarity can often be useful in distinguishing between areas of images with similar colour (such as sky and sea, or leaves and grass). Essentially, these calculate the relative brightness of selected pairs of pixels from each image. From these it is possible to calculate measures of image texture such as the degree of contrast, coarseness, directionality and regularity or periodicity, directionality and randomness. Texture queries can be formulated in a similar manner to colour queries, by selecting examples of desired textures from a palette, or by supplying an example query image. The system then retrieves images with texture measures most similar in value to the query.

6.2.4Shape retrieval

The ability to retrieve by shape is perhaps the most obvious requirement at the primitive level. Unlike texture, shape is a fairly well-defined concept – and there is considerable evidence that natural objects are primarily recognized by their shape. Two main types of shape feature are commonly used – global features such as aspect ratio, circularity and moment invariants and local features such as sets of consecutive boundary segments.

Then, at any stage in the algorithm (carried out in decreasing order of intensity values) is based on the following classification rules:

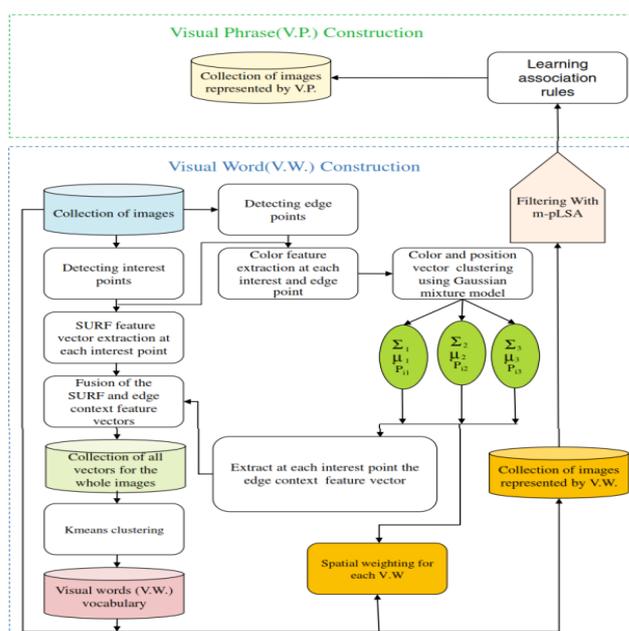
- If a region has no higher neighbour, then it is a local maximum and will be the seed of a blob.

- Else, if it has at least one higher neighbour, which is background, then it cannot be part of any blob and must be background.
- Else, if it has more than one higher neighbour and if those higher neighbours are parts of different blobs, then it cannot be a part of any blob, and must be background.
- Else, it has one or more higher neighbours, which are all parts of the same blob. Then, it must also be a part of that blob.

Compared to other watershed methods, the flooding in this algorithm stops once the intensity level falls below the intensity value of the so-called delimiting saddle point associated with the local maximum. However, it is rather straightforward to extend this approach to other types of watershed constructions. For example, by proceeding beyond the first delimiting saddle point a "grey-level blob tree" can be constructed. Moreover, the grey-level blob detection method was embedded in a scale space representation and performed at all levels of scale, resulting in a representation called the scale-space primal sketch. This algorithm with its applications in computer vision is described in more detail in Lindeberg's thesis as well as the monograph on scale-space theory partially based on that work.

6. Object Recognition Using Sift Features

Given SIFT's ability to find distinctive key points that are invariant to location, scale and rotation, and robust to affine transformations (changes in location, rotation, shear, and position) and changes in illumination, they are usable for object recognition. To increase robustness, matches are rejected for those key points for which the ratio of the nearest neighbor distance to the second nearest neighbor distance is greater than 0.8. This discards many of the false matches arising from background clutter. Finally, to avoid the expensive search required for finding the Euclidean-distance-based nearest neighbor, an approximate algorithm called the best-bin-first algorithm is used. For each candidate cluster, a least-squares solution for the best estimated affine projection parameters relating the training image to the input image is obtained.



8. Future Enhancements

Developments and studies are going on for further improvements in design and performance of "CONTENT BASED IMAGE RETRIEVAL SYSTEMS". In our project we have only done color analysis and the information about object location, shape, and texture is discarded. Shape and Texture analysis.

- Color Image histogram.
- Image ranking in Euclidean Distance method.

9. Conclusion

A graph based representation was proposed in a CBIR context. From a partition into regions processed by an efficient segmentation algorithm, a Region Adjacency Graph was built to consider spatial relationships between regions. Each region is characterized using a set of features based on the Color, Texture and Shape. A K-means clustering algorithm is applied to cluster the regions on the basis of these features.

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Democracy and Good Government in India: An Analysis

DR. SAKET KUMAR*

India, as a democratic republic, has been successfully operating for the last 66 years. The Journey of India's democracy began in 1950, with a great promise to secure to all its citizens social, economic and political justice, liberty of thought, expression, belief, faith and worship, and equality of status and opportunity. The promise of democracy in India has inspired many and continues to do so, as it sets the tone for the idea and practice of democracy. As democratic India will be 67 years old in about a year from now, it is time to review the achievements in the framework of good governance.

Democracy and Good Governance

It is indeed true that democracy as a system of government has always been important, and good governance came to the spotlight later on. The implied demands of good governance and real democracy are not very much different, perhaps, because the defining concepts of good governance have been evolved from those of real democracy. A democratic institution, over and above everything else, is expected to respond to the people's needs positively and constructively, effectively and purposefully, the same is expected from a system of good governance. Active and direct participation of the people in government is a prerequisite for ensuring liberty and equality to the people. Democracy as the rule by the people, is interpreted as a system where people are the sovereign and all citizens are politically and socially equal.¹

The key concepts relating to democracy are freedom and autonomy, equality, representation, majority rule and citizenship. Very recent documents from international organizations, as well as earlier debates and contemporary challenges, re-emphasize these key principles, of democracy, adding to the list accountability, electoral legitimacy, constitutional safeguards and functional institutions. Similarly, UNDP identifies participation, rule of law, transparency, responsiveness, consensus, orientation, equity, effectiveness and efficiency, accountability, and strategic vision as being the core characteristics of good governance.² It can be noted that the principles, of democracy and good governance are more or less the same.

It is, however, important to realize that good governance depends upon endeavour to work out a broad consensus in the society so as to achieve sustainable human development. The factor again underscores the significance of representative democracy as the form of Government only can claim inclusiveness and assure an environment that offers equity and optimum opportunities for improvement and growth. Of course, the output would depend upon the efficiency in the sustainable use of resources that are available. The goal of good governance, however, would elude a society if its system of governance does not have in place the mechanism to hold the persons wielding state power. accountable.³

Democracy, liberty and the rule of law together represent the troika that is universally accepted now as the index of a civil society. Good governance agenda places emphasis on civil society institutions to strengthen democracy and in constructing an informal sector that can harness people's entrepreneurship through community institutions, and inter-personal relationships. In the good governance discourse, democracy emerges as the

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necessary political frame work for successful economic liberalism are conceptually linked: bad governance equals state intervention, good governance equals democracy and economic liberalism.⁴

Civil society is seen as a source of vitality for both democracy as well as economic growth. Its institutions are a Countervailing force that curbs authoritarian practices and corruption. They also create or strengthen associational organizations that provide such; goods and services that can be provided more efficiently than the state. The space left by a retreating state can be filled by such private initiatives and proliferation of associations that manage local resources or deliver basic services will in turn support the trend towards greater participation and democracy. This belief is nurtured by the contention that social organizations succeed because there is collaborative action based on trust, norms and networks. It is these relationships popularized as social capital that builds capacity for participation and self government. The argument is that associations help generate social capital strengthens democracy and improves the efficiency of the markets.⁵

In this agenda of good governance, the conceptualizations of civil society proceeds on the assumption that power and exploitation is associated with the state, while freedom and liberty falls in the realm of civil society. This leads to a kind of romantic view of civil society where the existence of institutions outside the state become a sufficient basis to assume that state power is curbed and greater democratization is taking place. Such a perception does not take into account the characteristics of a society where there are associations, those of caste or of a religion, that exist primarily to curb the human rights of individuals.

Democracy signifies a government of, by and for the people. The protection of individual liberties follows the notion of democracy as a natural corollary. This entails the espousal of a methodical configuration of laws by which society might be regulated and different confliction interests can be harmonized to the fullest extent. This is why "the rule of law" is indispensable. It envisages the pre-eminence of law as opposed to anarchy or capricious dictates. It involves equal accountability of all before the law irrespective of high or low status.⁷

Etymologically, "governance can be traced back to the Greek verb *kubernan* (to pilot or steer) and was used by Plato with regard to the designing of a system of rule".⁸ In simple word, Governance is the preservation of prescribed and unofficial political set of laws of the game. It refers to those actions that engross setting the rules for the implementation of power and resolving differences over such; rules.⁹ But the new use of governance does not highlight state actors and institutions as the single applicable Institutions and actors in the authoritative share of ideals.¹⁰ "Every part of them, to some level, emphasize on the role of networks in the quest of universal aspirations; these networks in the quest of universal aspirations; these networks could be inter-governmental or inter-organizational¹¹; they could be trans-national¹² or they may perhaps be networks of conviction and reciprocity crossing the state-society divide".¹³

Conclusion

The terms governance and good governance are increasingly being used in various literature dealing with developmental studies. The concept governance describes about the process of decision making and the process by which decisions are implemented or not implemented. But, the concept good governance means proper implementation of decisions

essentially without abuse and corruption, by adapting values and regulations with the state at its core.

Good governance is not something that the government can achieve or do by itself. It depends on the co-operation and involvement of a large number of citizens and organizations. These requirements are considered not only essential for good governance but are important for Sustainable Human Development. In India, a large number of states, union territories and the central government have already taken several steps in this direction and much more action is expected.

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Optimization of Process Parameters in ECMM of Nickel Alloy Using Taguchi Based Grey Relational Analysis

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Abstract— The advancement in the field of mechanical engineering is essential to meet the growing demands of the industry. In particular the scope for alloy materials having high hardness, toughness and impact resistance has grown multi fold due to high level of design constraints. Electro Chemical Micro Machining (ECMM) machines are used to cut metals of any hardness or that are difficult or impossible to cut with traditional methods. Machine tool industry has made rapid growth in its manufacturing capabilities in last decade but these machine tools are yet to be utilized at their full potential due to insufficient data on optimum operating parameters. The objective of the present research work is to investigate the effects of the various ECMM process parameters on the MRR and dimensional deviation (DD) to obtain the optimal sets of process parameters using Taguchi based grey relational analysis.

Keywords—Electro Chemical Micro Machining (ECMM), optimization, Material removal rate (MRR), dimensional deviation (DD), Taguchi based grey relational analysis.

I. INTRODUCTION

The development in the field of mechanical engineering is necessary to meet the rising demands of the industry. In specific the scope for alloy materials having high hardness, toughness and impact resistance has grown rapidly due to high level of design constraints. Nickel and its alloys are the most sought material for manufacturing machines and components which needs to withstand high temperature, high pressure and aggressive chemical environment. Nickel alloys find wide application in a) gas turbines, b) high temperature fasteners, c) chemical processing and pressure vessels, and d) reactors of nuclear plants, etc. Micromachining is widely used to machine intricate shapes needed in medical and electronics fields. The conventional micro machining is not suitable for Nickel alloys due to hardening during machining. High pressure is developed between the tool and the work piece during machining. It forms layer on the surface of the work piece in stressed condition. This deformation causes a hardening effect on the surface of the work piece that slows down further machining.

In unconventional machining, most of the processes are thermal oriented, e.g. Electro discharge machining (EDM), laser beam machining (LBM), Electron beam machining (EBM), etc. It may cause thermal distortion on the machined surface. Chemical machining and Electro-chemical machining are thermal free processes, but chemical machining cannot be controlled precisely for the micromachining domain [1]. ECMM appears to be a very promising micromachining technology due to its advantages that include high MRR, better precision and control, rapid machining time, and environmentally acceptable [2].

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Electrochemical machining (ECM) was developed during late 1950s and early 1960s and used to machine difficult-to-cut materials in aerospace and other heavy industries for shaping and finishing operations [3]. It is an anodic dissolution process based on the phenomenon of electrolysis, whose laws were established by Michael Faraday. In ECM, electrolytes serve as conductor of electricity. The ECM plays a vital role in manufacturing of variety of parts ranging from large complicated shapes to a few microns in size. When ECM is performed at micro meter level (material removal that ranges from 1-999 μm), it is known as ECMM [4]. In ECMM process, the work piece is connected to anode and the micro tool is connected to cathode and they are placed inside the electrolyte with a small gap between them. On the application of adequate electrical energy, positive metal ions leave from the work piece and machining takes place. The machined particles are removed by circulation of electrolyte through electrode gap. By moving the tool at required rate the electrode gap has to be maintained for continuous machining.

The ECMM process is capable of machining tough and hard materials without inducing any residual stress and tool wear [5]. It is more suitable for Nickel alloy only the process parameters are optimized. The parameters subjected to the study are 1) Electrolyte Concentration 2) Machining Voltage, 3) Machining Current, 4) Duty Cycle, and 5) Frequency.

The grey relational analysis theory, initialized by Deng [6], makes use of this to handle uncertain systematic problem with only partial known information. This theory is adopted for solving the complicated interrelationships among the multiple responses in applications. The relationship between the desired and actual experimental results identified with grey relational coefficients. The multiple performance characteristics are observed through grey relational grade. Multi response can be converted into optimization of a single grey relational grade. The integrated grey based Taguchi method combines both grey relational analysis and Taguchi method [7]. This method was successfully applied to optimize the multiple performance characteristics of complicated problems in manufacturing processes. Furthermore, a statistical analysis of variance (ANOVA) is performed to see which process parameters are statistically significant [8]. In this study, the effect of CNC turning parameters on MRR and DD are reported using grey based fuzzy logic.

II. GREY BASED TAGUCHI METHOD

The integrated Grey based Taguchi method combines the algorithm of Taguchi method and grey relational analysis to determine the optimum process parameters with multi responses.

2.1 Taguchi Method

The concept of the Taguchi method is that the parameter design is performed to reduce the sources of variation on the quality characteristics of product, and reach a target of process robustness [9]. The Taguchi method utilizes the orthogonal arrays from experimental design theory to study a large number of variables with a small number of experiments [10,11]. Furthermore, the conclusions drawn from small scale experiments are valid over the entire experimental region spanned by the control factors and their level settings [9]. A loss function is defined to calculate the deviation between the experimental value and the desired value [10]. Taguchi recommends the use of the loss function to measure the performance characteristic deviating from the desired value [11]. The value of the loss function is further transformed into an S/N ratio. Three categories of performance characteristic in the analysis of the S/N ratio are, lower-the-better, higher-the-better, and

nominal-the-best. The S/N ratio η_{ij} for the i^{th} performance characteristic in the j^{th} experiment can be expressed as

$$\eta_{ij} = -10\log(L_{ij}) \tag{1}$$

The loss function L_{ij} for higher-the-better performance characteristic can be expressed as

$$L_{ij} = \frac{1}{n} \sum_{k=1}^n \frac{1}{y_{ijk}^2} \tag{2}$$

L_{ij} -loss function of the i^{th} process response in the j^{th} experiment, k - number of tests

y_{ijk} -experimental value of the i^{th} performance characteristic in the j^{th} experiment at the k^{th} tests

For lower-the-better performance characteristic, the loss function L_{ij} can be expressed as

$$L_{ij} = \frac{1}{n} \sum_{k=1}^n y_{ijk}^2 \tag{3}$$

For nominal-is-best performance characteristics, the S/N ratio can be expressed as

$$\eta_{ij} = 10\log(\bar{y}^2 / \sigma) \tag{4}$$

The S/N ratio for each level of parameters is computed. Irrespective of the category of the performance characteristic, a larger S/N ratio corresponds to a better performance characteristic. It is used for the optimization of single objective problems. However, optimization of multiple performance characteristics cannot be straightforward as in the optimization of a single performance characteristic [12]. Combined approaches are proposed by researchers for overcoming the limitations. In this, grey based Taguchi method is adopted to optimize the multiple performances.

2.2 Grey Relational Analysis

The grey system theory can be used to solve the complex relationships among the multiple response characteristics effectively. In grey relational analysis, black represents having no information system has a level of information between black and white. In a white system, the associations among factors in the system are known; in a grey system, the associations among factors in the system are unknown. It is applied in optimization of WEDM process, EDM process, chemical-mechanical polishing process, in drilling operation and turning operation with multiple performance characteristics [13, 14, 15, 16, 17, 18, 20].

Data pre-processing is the first stage in grey analysis since the range and unit in one data sequence may differ from the others. Data pre-processing is a means of transferring the original sequence to a comparable sequence.

Experimental data y_{ij} is normalized as $Z_{ij}(0 \leq Z_{ij} \leq 1)$ for the i^{th} performance characteristics in the j^{th} experiment can be expressed as [12]:

For SN ratio with Larger-the-better condition

$$Z_{ij} = \frac{y_{ij} - \min(y_{ij}, i = 1, 2, \dots, n)}{\max(y_{ij}, i = 1, 2, \dots, n) - \min(y_{ij}, i = 1, 2, \dots, n)} \tag{5}$$

For SN ratio with smaller-the-better

$$Z_{ij} = \frac{\max(y_{ij}, i = 1, 2, \dots, n) - y_{ij}}{\max(y_{ij}, i = 1, 2, \dots, n) - \min(y_{ij}, i = 1, 2, \dots, n)} \tag{6}$$

For SN ratio with nominal-the-best

$$Z_{ij} = \frac{(y_{ij} - \text{Target}) - \min(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n)}{\max(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n) - \min(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n)} \quad (7)$$

According to Deng [6], larger normalized results correspond to better performance and the best normalized result should be equal to one. Then, the grey relational coefficients are calculated to express the relationship between the ideal (best) and the actual experimental results [20].

The Grey relational Co-efficient γ_{ij} can be expressed as [12]:

$$\gamma_{ij} = \frac{\Delta_{\min} + \xi \Delta_{\max}}{\Delta_{oj}(k) + \xi \Delta_{\max}} \quad (8)$$

Where,

- a. $j=1, 2, \dots, n; k=1, 2, \dots, m$, n is the number of experimental data items and m is the number of responses.
- b. $y_o(k)$ is the reference sequence ($y_o(k)=1, k=1, 2, \dots, m$); $y_j(k)$ is the specific comparison sequence.
- c. $\Delta_{oj} = \|y_o(k) - y_j(k)\|$ = The absolute value of the difference between $y_o(k)$ and $y_j(k)$
- d. $\Delta_{\min} = \min_{\forall j \in i} \min_{\forall k} \|y_o(k) - y_j(k)\|$ is the smallest value of $y_j(k)$
- e. $\Delta_{\max} = \max_{\forall j \in i} \max_{\forall k} \|y_o(k) - y_j(k)\|$ is the largest value of $y_j(k)$
- f. ξ is the distinguishing coefficient which is defined in the range $0 \leq \xi \leq 1$ (the value may adjusted based on the practical needs of the system)

The Grey relational grade $\overline{\gamma}_j$ is expressed as [12]:

$$\overline{\gamma}_j = \frac{1}{k} \sum_{i=1}^m \gamma_{ij} \quad (9)$$

Where $\overline{\gamma}_j$ is the grey relational grade for the j^{th} experiment and k is the number of performance characteristics. It shows the relationship between the reference sequence and the actual sequence. The value of grey relational grade ranges from 0 and 1 and if it is 1 these two sequences are identically same. The greater grey relational grade infers the better quality; based on grey relational grade, the effect of factor can be assessed and the optimal level for each factor can also be calculated.

2.3 Grey based Taguchi method

The structure of the integrated grey based Taguchi algorithm is illustrated in Fig.1 and summarized as follows

Step 1: Adopting an appropriate orthogonal array to plan the experimental design and determining the level of parameters

Step 2: Conduct the experiments based on the arrangement of the orthogonal array

Step 3: Calculate the total loss function and the S/N ratio based on equations

Step 4: Data pre-processing of S/N ratio of machining responses

Step 5: Compute the grey relational coefficient of each performance characteristics

Step 6: Determine the grey relational grade by using the formula

Step 7: Calculate the mean grey relational grade for each level and plot their response graph

Step 8: Select the optimal level setting of machining parameters from response table and response graph

Step 9: Analyze the grey relational grade with ANOVA

Step 10: Validate the optimal process parameters through Confirmation test

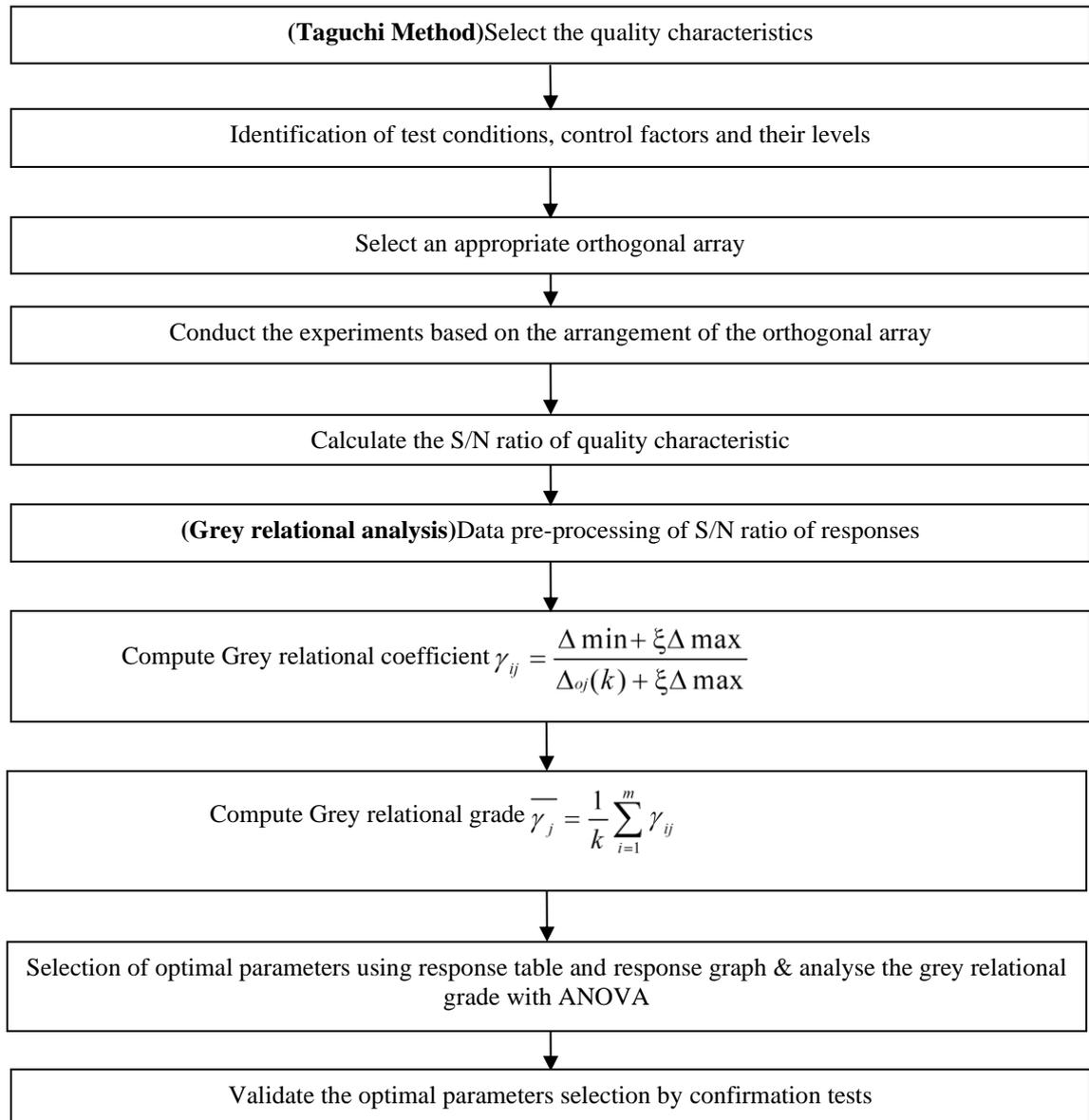


Fig.1. Structure of Grey based Taguchi method

III. DETERMINATION OF OPTIMAL MACHINING PARAMETERS

3.1 Experimental details

The ECMM system developed to conduct necessary experiments for this research work is shown in Fig. 2 and it has the following five major assemblies: 1. Work holding platform, 2. Tool feeding device, 3. Control system, 4. Electrolyte flow system, 5. Power supply system.

The structure of the machine body is done by mild steel. Fibre materials are used where the parts that will contact electrical system. Parts that come into contact with electrolyte require noncorrosive materials and hence acrylic material is used in those places. The machining setup comprises of base over which a rectangular column is mounted. To achieve very low feed of the electrode, thread has been made at 30 threads per inch for a length of 75 mm in the mid portion of the main screw rod. This allows the linear up and downward feed of electrode to a required level. Through the stepper motor the electrode feed movements are achieved. Just below the tool electrode holding devices, the machining chamber rests on a base plate.

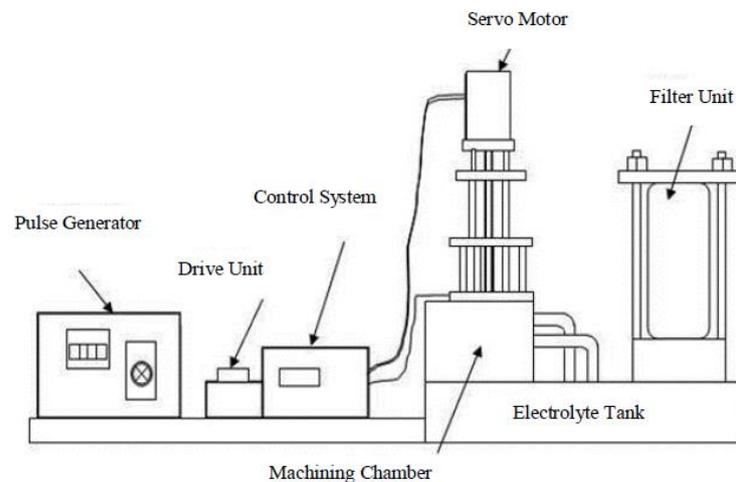


Fig.2 Schematic Diagram of Experimental Setup

The work piece which is of few microns thick is held in the fixture, made up of two blocks of insulating material fastened with screws. The complete developed experimental setup is shown in Fig. 3.



Fig.3 Experimental Setup

In order to identify the true behaviour of MRR, five process parameters each at three levels have been considered for this study as shown in Table 1. A set of three levels assigned to each process parameter with two degrees of freedom (DOF) as per Taguchi experimental design philosophy. This gives a total of ten DOF for five process parameters selected in this work.

TABLE 1: PROCESS PARAMETERS AND THEIR LEVELS

Factor	Electrolyte concentration	Machining Voltage	Machining Current	Duty cycle	Frequency
Level 1	0.1	3.5	0.1	33.33	30
Level 2	0.2	5.0	0.3	50.00	40
Level 3	0.3	6.5	0.5	66.66	50

The process parameters Electrolyte concentration, Machining Current, Machining Voltage, Duty Cycle, and Frequency are studied in this investigation with each parameter having two degrees of freedom. As per the standards of Taguchi methodology, 7 degrees of freedom assigned for Error. Thus we have a total of 17 DOF for the factors as well as the interactions considered for the present experiments. The nearest three level orthogonal array available satisfying the criterion of selecting the OA is L₁₈ having 17 DOF [19]. The layout of experiments designed using Taguchi Design methodology has been furnished in Table 2.

TABLE 2: EXPERIMENT LAYOUT USING L₁₈ ORTHOGONAL ARRAY

Exp. No	Levels of Process Parameters				
	Electrolyte concentration	Machining Voltage	Machining Current	Duty cycle	Frequency
1	1	1	1	1	1
2	1	2	2	2	2
3	1	3	3	3	3
4	2	1	1	2	2
5	2	2	2	3	3
6	2	3	3	1	1
7	3	1	2	1	3
8	3	2	3	2	1
9	3	3	1	3	2
10	1	1	3	3	2
11	1	2	1	1	3
12	1	3	2	2	1
13	2	1	2	3	1
14	2	2	3	1	2
15	2	3	1	2	3
16	3	1	3	2	3
17	3	2	1	3	1
18	3	3	2	1	2

The levels of process parameters are selected based on the research done by various researchers and based on the pilot experiments conducted for this research work. The levels of process parameters selected based on the Taguchi's design methodology for Nickel to fit L₁₈ orthogonal array is given in table 3.

The ECMM experiments are conducted with brass wire tool of 250 microns diameter for Nickel. In order to achieve proper circularity of machined holes, the anode tool is properly ground. The test job specimens are kept uniform in size of 50 mm × 25 mm × 0.15 mm.

The ECMM experiments were conducted twice in each combination of process parameters to study its effect over MRR. From the trial 1 and trial 2 experiments, the average MRR is

calculated and tabulated for Nickel in table 4. It can be seen from the experimental results of Nickel, the obtained MRR ranges from 0.001369 to 0.009577 mm³/min, while the dimension deviation stood between 11 and 31 microns.

TABLE 3: ORTHOGONAL ARRAY OF PROCESS PARAMETERS

Exp. No	Electrolyte Concentration (mol/lit)	Machining Voltage (Volts)	Machining Current (Amps)	Duty cycle (%)	Frequency (Hz)
1	0.1	3.5	0.1	33.33	30
2	0.1	5.0	0.3	50.00	40
3	0.1	6.5	0.5	66.66	50
4	0.2	3.5	0.1	50.00	40
5	0.2	5.0	0.3	66.66	50
6	0.2	6.5	0.5	33.33	30
7	0.3	3.5	0.3	33.33	50
8	0.3	5.0	0.5	50.00	30
9	0.3	6.5	0.1	66.66	40
10	0.1	3.5	0.5	66.66	40
11	0.1	5.0	0.1	33.33	50
12	0.1	6.5	0.3	50.00	30
13	0.2	3.5	0.3	66.66	30
14	0.2	5.0	0.5	33.33	40
15	0.2	6.5	0.1	50.00	50
16	0.3	3.5	0.5	50.00	50
17	0.3	5.0	0.1	66.66	30
18	0.3	6.5	0.3	33.33	40

TABLE 4 EXPERIMENTAL RESULTS

Exp. No	Material Removal Rate (mm ³ /min.)	Dimensional Deviation (microns)
1	0.001632	29
2	0.002123	13
3	0.006307	20
4	0.001839	21
5	0.004033	22
6	0.006703	14
7	0.002874	25
8	0.009577	20
9	0.003226	14
10	0.003724	25
11	0.001369	11
12	0.004675	31
13	0.004807	22
14	0.004402	14
15	0.001880	23
16	0.003931	15
17	0.003393	14
18	0.006546	15

Dimensional deviation

In this work, the main emphasis is given for studying effects on process parameters on MRR and Dimensional Deviation (DD). A comparative study on the effects of process parameters on MRR Vs DD is made and the outcome is detailed hereunder. In order to easily compare the MRR and corresponding DD obtained is plotted on logarithmic scale for Nickel as given in Fig. 4.

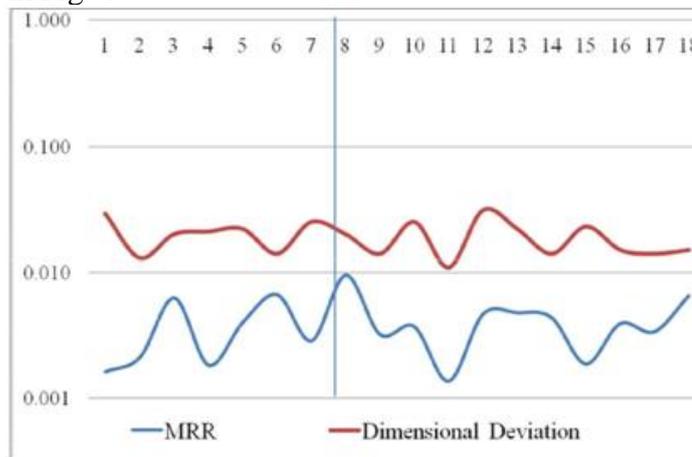


Fig.4 MRR Vs Dimensional Deviation (DD)

3.2 Optimization of machining parameters

Initially, the S/N ratios for a given responses are computed using one of the Eqs. (1), (2) and (3) depending upon the type of quality characteristics. The normalized values for each response S/N ratios are estimated using Eqs. (5), (6) and (7). The computed S/N ratios for each quality characteristic and the normalized values of S/N ratios are shown in Table 5. Grey relational coefficient for each performance characteristics have been calculated using Eq. (8). The value for ξ is taken as 0.5 since both the process parameters are of equal weighting. The results are shown in Table 6. The grey relational grade can be calculated by using Eq. (9), which is the overall representative of both the responses shown in Table 6. Now, the multiple performance characteristics optimization problem has been transformed into a single equivalent objective function optimization problem using this approach. The higher grey relational grade is said to be close to the optimal.

TABLE 5 S/N RATIO VALUES AND NORMALIZED S/N RATIO VALUES MRR AND DD

Ex.No	MRR-S/N ratio	DD-S/N ratio	Data Pre-processing-MRR	Data Pre-processing-DD
1	-55.7456	-29.2480	0.0903	0.9356
2	-53.4610	-22.2789	0.2255	0.9000
3	-44.0035	-26.0206	0.7853	0.5500
4	-54.7084	-26.4444	0.1517	0.5000
5	-47.8874	-26.8485	0.5554	0.4500
6	-43.4746	-22.9226	0.8166	0.8500
7	-50.8303	-27.9588	0.3812	0.3000
8	-40.3754	-26.0206	1.0000	0.5500
9	-49.8267	-22.9226	0.4406	0.8500
10	-48.5798	-27.9588	0.5144	0.3000

11	-57.2719	-20.8279	0.0000	1.0000
12	-46.6044	-29.8272	0.6313	0.0000
13	-46.3625	-26.8485	0.6457	0.4500
14	-47.1270	-22.9226	0.6004	0.8500
15	-54.5168	-27.2346	0.1631	0.4000
16	-48.1099	-23.5218	0.5422	0.8000
17	-49.3883	-22.9226	0.4666	0.8500
18	-43.6805	-23.5218	0.8044	0.8000

The mean response table for overall grey relational grade is shown in Table 7 and is represented graphically in Fig.5. The mean grey relational grade for the electrolyte concentration at level 1 calculated by averaging the grey relational grades for the experiments 1-3 and 10-12 similarly levels 2 and 3 are calculated. The mean grey relational grade for each level of the other parameters can be computed in the similar way. With the help of the Table 7 and Fig.5, the optimal parameter combination has been determined. The optimal factor setting condition is $A_3B_2C_3D_1E_1$.

TABLE 6 GREY RELATIONAL COEFFICIENTS OF RESPONSES MRR AND DD

Ex.No	GRC-MRR	GRC-DD	GR Grade	Rank
1	0.3547	0.8860	0.6203	8
2	0.3923	0.8333	0.6128	11
3	0.6996	0.5263	0.6129	10
4	0.3708	0.5000	0.4354	16
5	0.5293	0.4762	0.5028	13
6	0.7316	0.7692	0.7504	2
7	0.4469	0.4167	0.4318	17
8	1.0000	0.5263	0.7632	1
9	0.4720	0.7692	0.6206	7
10	0.5073	0.4167	0.4620	14
11	0.3333	1.0000	0.6667	4
12	0.5756	0.3333	0.4545	15
13	0.5852	0.4762	0.5307	12
14	0.5558	0.7692	0.6625	5
15	0.3740	0.4545	0.4143	18
16	0.5221	0.7143	0.6182	9
17	0.4838	0.7692	0.6265	6
18	0.7188	0.7143	0.7165	3

TABLE 7 RESPONSE TABLE - GREY RELATIONAL GRADE

Parameters	Level 1	Level 2	Level 3	MAX-MIN
A	0.5715	0.5494	0.6295	0.0964
B	0.5164	0.6391	0.5949	0.1227
C	0.5640	0.5415	0.6449	0.1033
D	0.6414	0.5497	0.5593	0.0821
E	0.6243	0.5850	0.5411	0.0439

Using the grey-fuzzy reasoning grade value, ANOVA is formulated for identifying the significant factors. The results of ANOVA are given in Table 8. From the ANOVA results, it is clear that Machining Voltage (25.27 %) influences more on ECMM of nickel followed by Machining Current (20.38 %), Duty cycle (18.18 %), Frequency (13.82 %) and Electrolyte concentration (13.69 %).

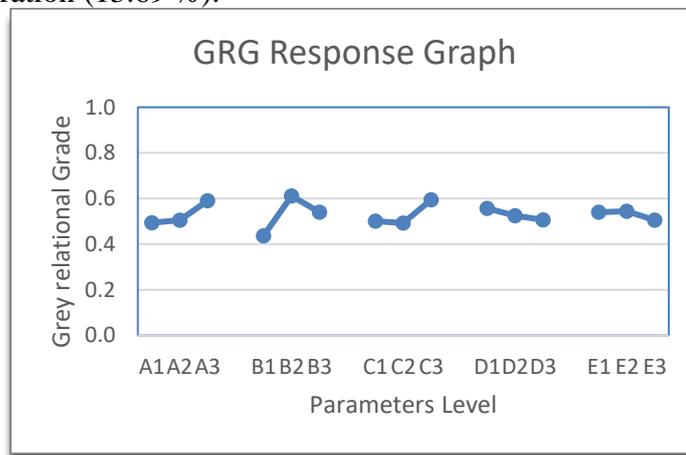


Fig.5 The response graph for each level of machining parameters

TABLE 8 RESULTS OF THE ANOVA

Factor	DOF	SS	MS	F-Test	F-Table	% Contn
A	2	0.0305	0.0153	1.5885	18.50	13.69
B	2	0.0563	0.0282	2.9323	18.50	25.27
C	2	0.0454	0.0227	2.3646	18.50	20.38
D	2	0.0405	0.0203	2.1094		18.18
E	2	0.0308	0.0154	1.6042		13.82
Error	7	0.0193	0.0028			8.66
Total	17	0.2228				100.00

3.3 Confirmation Test

The optimum level of process parameters has been determined by using S/N ratio values (higher-the-better). After the selection of optimal level of the process parameters, the ultimate step is to predict and validate the improvement of the response characteristic using the optimal level of the parameters. The purpose of conformation test is to validate the conclusions drawn from analysis of experimental results. The predicted or estimated GRG (η) using optimal levels of process parameters can be calculated with the following equation;

$$\eta = \eta_m + \frac{1}{q} \sum_{i=1}^q (\eta_i - \eta_m)$$

η_m - Total mean of GRG

η_i - Mean of GRG at optimum level

q – No. of significant parameters

After predicting the response (GRG), a confirmation experiment has been designed and conducted with the optimal level of the machining parameters to verify the improvement of performance characteristics is shown in Table 9.

TABLE 9 THE COMPARISON RESULTS OF INITIAL AND OPTIMAL MACHINING PERFORMANCE

Initial machining parameters	Optimal machining parameters	
	Prediction	Experiment
Levels A ₁ B ₂ C ₂ D ₂ E ₂	A ₃ B ₂ C ₃ D ₁ E ₁	A ₃ B ₂ C ₃ D ₁ E ₁
MRR (mm ³ /min.)	0.002123	0.00894
DD (microns)	13	16
Taguchi-Grey relational grade	0.8451	0.8002
Improvement of Taguchi-Grey relational grade	0.2322	0.1873

IV. CONCLUSIONS

The effects of process parameters and the optimum cutting parameters for ECMM process on the multiple objectives are systematically investigated by Taguchi based grey relational analysis with orthogonal arrays. The following conclusions are obtained Approach of Taguchi based grey relational analysis was a productive method for optimizing the multi-objectives such as MRR and DD in ECMM of nickel. In the results of ANOVA, it is revealed that machining voltage, electrolyte concentration and machining current are predominant factors which affect the ECMM of Nickel. Machining Voltage (25.27 %) influences more on ECMM of nickel followed by Machining Current (20.38 %), Duty cycle (18.18 %), Frequency (13.82 %) and Electrolyte concentration (13.69 %). The best performance characteristics were obtained with optimal setting A₃B₂C₃D₁E₁.

Through the optimum procedure of Taguchi-grey with orthogonal arrays, the level constitution of optimal cutting parameters are acquired and verified by confirmation test. The results proved that the multiple objectives are improved simultaneously by using this approach.

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Multi-Response Optimization of Electro Chemical Micro Machining (ECMM) Of Nickel Using Fuzzy Based Grey Relational Analysis

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Abstract:-The development in the field of mechanical engineering is needed to meet the increasing demands of the industry. In specific the scope for alloy materials having high hardness, toughness and impact resistance has grown rapidly due to high level of design constraints. Electro Chemical Micro Machining (ECMM) machines are used to cut metals of any hardness or that are difficult or impossible to cut with conventional methods. Machine tool industry has made exponential growth in its manufacturing capabilities in last decade but these machine tools are yet to be utilized at their full potential due to inadequate data on optimum operating parameters. The objective of the present research work is to investigate the effects of the various ECMM process parameters on the MRR and dimensional deviation to obtain the optimal sets of process parameters by using fuzzy based grey relational analysis.

Keywords:-Electro Chemical Micro Machining (ECMM), Optimization, Material removal rate (MRR), Dimensional deviation (DD), Orthogonal array, Fuzzy based grey relational analysis

Introduction

The growth in the field of mechanical engineering is necessary to meet the rising demands of the industry. In particular the scope for alloy materials having high hardness, toughness and impact resistance has grown rapidly due to high level of design constraints. Nickel and its alloys are the most sought material for manufacturing machines and components which needs to withstand high temperature, high pressure and aggressive chemical environment. Nickel alloys find wide application in a) gas turbines, b) high temperature fasteners, c) chemical processing and pressure vessels, and d) reactors of nuclear plants, etc. Micromachining technology is extensively used to machine complex shapes required in medical and electronics industries. The micro machining of Nickel alloys can be difficult using traditional machining techniques as they easily harden during machining. High pressure is developed between the tool and the work piece during machining. Such high pressure produces a stressed layer of deformed metal on the surface of the work piece. This deformation causes a hardening effect on the surface of the work piece that slows down further machining.

In unconventional machining, most of the processes are thermal oriented, e.g. Electro discharge machining (EDM), laser beam machining (LBM), Electron beam machining (EBM), etc. These processes may cause thermal distortion of the machined surface. Chemical machining and Electro-chemical machining are thermal free processes, but chemical machining cannot be controlled precisely for the micromachining domain [1]. ECMM appears to be a very promising micromachining technology due to its advantages

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that include high MRR, better precision and control, rapid machining time, and environmentally acceptable [2]. ECMM also permits machining of chemically resistant materials like Titanium, Copper alloys, Super alloys, and Stainless steel, which are widely used in biomedical, electronic, and MEMS applications.

Electrochemical machining (ECM) was developed during late 1950s and early 1960s and used to machine difficult-to-cut materials in aerospace and other heavy industries for shaping and finishing operations [3]. It is an anodic dissolution process based on the phenomenon of electrolysis, whose laws were established by Michael Faraday. In ECM, electrolytes serve as conductor of electricity. ECM offers a number of advantages over other machining methods. The ECM technique now plays an important role in the manufacturing of a variety of parts ranging from machining of large metallic pieces of complicated shapes to opening of windows in silicon that are a few microns in size. When ECM is performed at micro meter level (material removal that ranges from 1-999 μm), it is known as ECMM [4]. In ECMM process, the work piece is connected to anode and the micro tool is connected to cathode and they are placed inside the electrolyte with a small gap between them. On the application of adequate electrical energy, positive metal ions leave from the work piece and machining takes place. Electrolyte circulation removes the machined particles from the electrode gap. To continue the machining process, the electrode gap has to be maintained by moving the tool at required rate.

The ECMM process is capable of machining tough and hard materials without inducing any residual stress and tool wear [5]. In this process no physical force is directly applied to the material, the finished work piece is free from any deformation. The application of ECMM for Nickel alloy is more suitable but it cannot be applied effectively unless the process parameters are optimized. The parameters subjected to the study are 1) Electrolyte Concentration 2) Machining Voltage, 3) Machining Current, 4) Duty Cycle, and 5) Frequency.

The grey relational analysis theory initialized by Deng (1989) [6] makes use of this to handle uncertain systematic problem with only partial known information. This theory is adopted for solving the complicated interrelationships among the multiple objectives. This approach converts multi-objective optimization into optimization of single grey relational grade. This method was applied to optimize the multi-objective problems in electrical discharge machining [7], wire cut electrical discharge machining [8], drilling operation [9] and chemical-mechanical polishing process [10]. The theory of fuzzy logics initiated by Zadeh (1965) [11] has been proven to be useful for dealing with uncertain and vague information. The definition of objectives such as lower-the-better, higher-the-better and nominal-the-best contains certain degree of uncertainty and vagueness. Hence the fuzzy logic is applied to establish the optimal setting of parameters for multiple objectives. This method was applied to optimize the multi-objective problems in electrical discharge machining process [12], [13], [14].

The grey based fuzzy logic approach has advantage of both grey relational analysis and fuzzy logic method. Optimization of complicated multi objectives can be converted into single objective through this method i.e. grey-fuzzy reasoning grade. The optimum level of process parameters are the level with higher value of mean grey-fuzzy reasoning grade. This method was successfully applied to optimize the multiple objectives of complicated problems in manufacturing process [15], design parameters of pin-fin heat sink [16] and process design of an injection-moulded part [17]. In this study, the effect of CNC turning

parameters on power consumption and surface roughness are reported using grey based fuzzy logic. The significant contribution of each cutting parameters to the multiple objectives are calculated by using ANOVA [18]. In this study, the fuzzy based grey relational analysis technique has been used to investigate the effects of the parameters and subsequently to predict sets of optimal parameters for maximum MRR and minimum dimensional deviation (DD) in the ECMM process.

V. METHODOLOGY

Grey Relational Analysis

The grey relational analysis based on the grey system theory can be used to solve the complicated interrelationships among the multiple performance characteristics effectively [6]. In grey relational analysis, system has a level of information between black and white. In other words, in a grey system, some information is known and some information is unknown. In a white system, the relationships among factors in the system are certain; in a grey system, the relationships among factors in the system are uncertain.

Data pre-processing is normally required since the range and unit in one data sequence may differ from the others. Data pre-processing is also necessary when the sequence scatter range is too large, or when the directions of the target in the sequences are different. Data pre-processing is a means of transferring the original sequence to a comparable sequence. Depending on the characteristics of a data sequence, there are various methodologies of data pre-processing available for the grey relational analysis. Experimental data y_{ij} is normalized as $Z_{ij} (0 \leq Z_{ij} \leq 1)$ for the i^{th} performance characteristics in the j^{th} experiment can be expressed [19] as:

For Larger-the-better condition

$$Z_{ij} = \frac{y_{ij} - \min(y_{ij}, i = 1, 2, \dots, n)}{\max(y_{ij}, i = 1, 2, \dots, n) - \min(y_{ij}, i = 1, 2, \dots, n)} \tag{1}$$

For smaller-the-better

$$Z_{ij} = \frac{\max(y_{ij}, i = 1, 2, \dots, n) - y_{ij}}{\max(y_{ij}, i = 1, 2, \dots, n) - \min(y_{ij}, i = 1, 2, \dots, n)} \tag{2}$$

For nominal-the-best

$$Z_{ij} = \frac{(y_{ij} - \text{Target}) - \min(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n)}{\max(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n) - \min(|y_{ij} - \text{Target}|, i = 1, 2, \dots, n)} \tag{3}$$

Then, calculate grey relational co-efficient γ_{ij} for the normalized values.

$$\gamma_{ij} = \frac{\Delta \min + \xi \Delta \max}{\Delta_{oj}(k) + \xi \Delta \max} \tag{4}$$

Where

- a. $j=1, 2 \dots n; k=1, 2 \dots m$, n is the number of experimental data items and m is the number of responses.
- b. $y_o(k)$ is the reference sequence ($y_o(k)=1, k=1, 2 \dots m$); $y_j(k)$ is the specific comparison sequence.
- c. $\Delta_{oj} = \|y_o(k) - y_j(k)\|$ = The absolute value of the difference between $y_o(k)$ and $y_j(k)$
- d. $\Delta_{\min} = \min_{\forall j \in i} \min_{\forall k} \|y_o(k) - y_j(k)\|$ is the smallest value of $y_j(k)$

e. $\Delta_{\max} = \max_{\forall j \in i} \max_{\forall k} \|y_o(k) - y_j(k)\|$ is the largest value of $y_j(k)$

f. ζ is the distinguishing coefficient which is defined in the range $0 \leq \zeta \leq 1$ (the value may adjusted based on the practical needs of the system)

This grey relation co-efficient γ_{ij} is applied to show the relationship between the optimal (best=1) and actual normalized results. The higher value of γ_{ij} represents, the corresponding experimental result is closer to the optimal (best) normalized value for the single response.

Fuzzy Logic

Fuzzy logic is a way to representing information that mimics human reasoning about information [20]. The most interesting fact about fuzzy logic is that fuzzy inferences make it possible to deduce a proposition similar to the consequence from some proposition that is similar to the antecedent. It is an effective mathematical model of resolving problems in a simple way which contain the uncertain and huge information [12]. In fuzzy logic analysis, the fuzzifier uses membership functions (MFs) to fuzzify the grey relational coefficient. The fuzzy inference engine then performs a fuzzy inference on fuzzy rules in order to generate a fuzzy value. Finally, the defuzzifier converts the fuzzy value into a grey-fuzzy reasoning grade. Fuzzy expert system has 3 simple steps shown in Figure 1 and defined below

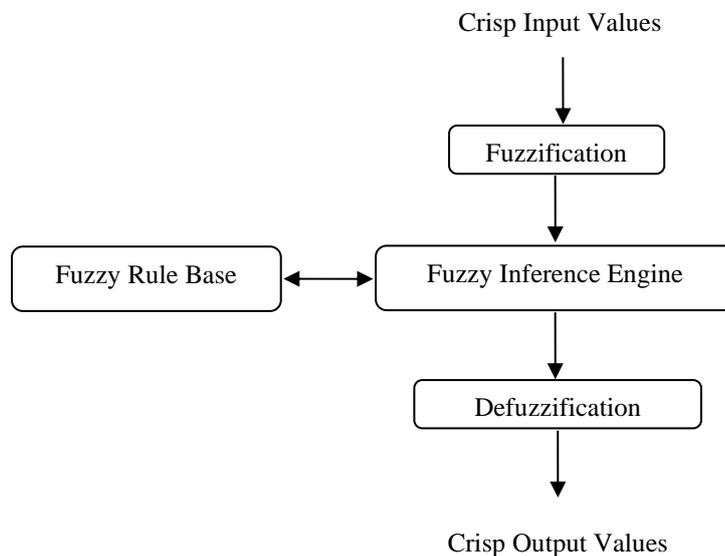


Fig 1 Fuzzy Expert System Model

Step 1 Fuzzification: In a fuzzy expert system application, each input variable's crisp value is first fuzzified into linguistic values before the inference engine proceeds in processing with the rule base.

Step 2 Inference engine: The collection of fuzzy IF-THEN rules is stored in the fuzzy rule base which is referred to by the inference engine when processing inputs. Once all crisp input values have been fuzzified into their respective linguistic values, the inference engine

will access the fuzzy rule base of the fuzzy expert system to derive linguistic values for the intermediate as well as the output linguistic variables.

Step 3 Defuzzification: The last phase is the defuzzification of the linguistic values of the output linguistic variables into crisp values. The most common techniques for defuzzification are Center-of-Maximum (CoM) and Center-of-Area (CoA). The fuzzy inference output $\mu_{C_0}(y)$ transferred to a non-fuzzy value y_0 by using the centroid defuzzification method, i.e.

$$y_0 = \frac{\sum y \mu_{C_0}(y)}{\sum \mu_{C_0}(y)}$$

This non-fuzzy value y_0 is called as grey-fuzzy reasoning grade. The grey-fuzzy reasoning grade is used to optimize the multiple objectives and the relational degree between main factor and other factors for each performance characteristics. The higher grey-fuzzy reasoning grade indicates that the experimental result closer to the ideally normalized value. The mean value of grey-fuzzy reasoning grade for each level of parameters is used to construct response table and response graph. The optimum level of machining parameters is the level with higher value of mean grey-fuzzy reasoning grade for each factor concerning power consumption and surface roughness. To identify the contribution of process parameters on multi objectives ANOVA is carried out. Finally the confirmation test is conducted to validate the optimum parameter setting.

The scheme of the proposed grey based fuzzy logic approach is illustrated in Figure 2 and steps are summarized [21] as follows

Stage I: Data collection by using design of experiments

Step 1: Design an appropriate orthogonal array to plan the experimental design and determining the level of parameters

Step 2: Conduct the experiment based on the arrangement of the orthogonal array

Stage II: Grey based Fuzzy logic method for multi-objective optimization

Step 3: Data pre-processing of experimental results using Eqs. (1) – (3)

Step 4: Compute the grey relational coefficient for each objectives by using Eq. (4)

Step 5: Establishing the membership function and fuzzy rule to fuzzify the inputs (grey relational coefficient of each response) of fuzzy logic.

Step 6: The fuzzy logic output (grey-fuzzy reasoning grade for multi-objectives) is calculated by defuzzification of the output linguistic variables into crisp values.

Step 7: Mean response for each level of process parameters are calculated and presented in the form of response table and response graph.

Step 8: Select the optimal level of machining parameters by which level of each individual parameter having higher value of mean grey-fuzzy reasoning grade in response table and response graph.

Stage III: Analysis of process parameters contribution:

Step 9: Analyze the grey-fuzzy reasoning grade with ANOVA

Stage IV: Validate the optimum parameters through confirmation test

Step10: Verify the optimal process parameters through Confirmation test

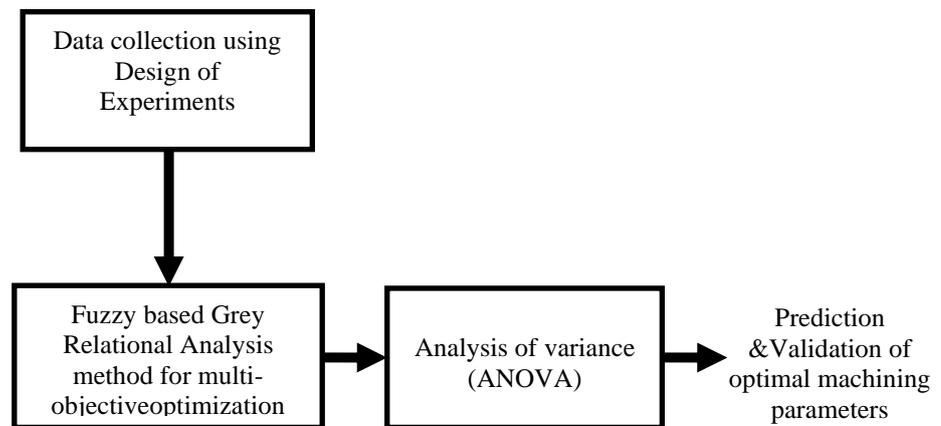


Fig 2 Scheme of the proposed grey based fuzzy logic method

VI. EXPERIMENTAL SETUP

The ECMM system developed to conduct necessary experiments for this research work is shown in Figure 3 and it has the following five major assemblies: 1. Work holding platform, 2. Tool feeding device, 3. Control system, 4. Electrolyte flow system, 5. Power supply system.

Mild steel is selected for the structure of the machine body. For the parts that come into contact with electrical system which requires insulation, fiber material is used. Parts that come into contact with electrolyte require noncorrosive materials and hence acrylic material is used in those places. The machining setup structure consists of machining base over which a rectangular column is mounted. In order to achieve very fine feed of the electrode, thread has been made at 30 threads per inch for a length of 75 mm in the mid portion of the main screw rod. This enables the linear up and downward feed of electrode to a required level in accordance with the depth of the electrolyte chamber and work piece placement in it. When the stepper motor rotates, the lead screw rotates, which in turn moves the micro tool electrode holding device which provides electrode feed movements. Just below the tool electrode holding devices, the machining chamber rests on a base plate.

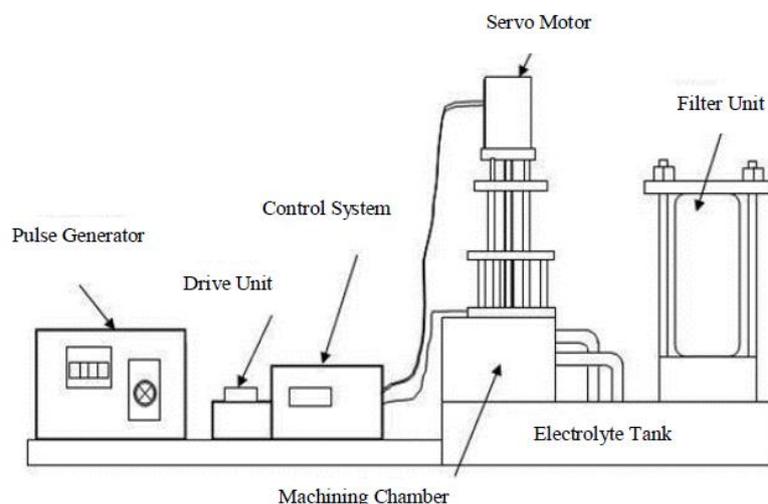


Fig 3 Schematic Diagram of Experimental Setup

The base plate is provided with four bushes at the bottom for easy handling. The dimensions of other parts are calculated considering space arrangement and functional requirements. Inside the machining chamber, a work holding device is mounted. The work piece which is of few microns thick is held in the fixture, made up of two block of insulating material fastened with screws. The one side of the fixture is connected with a wire to the workpiece and made as anode. The complete developed experimental setup is shown in Figure 4.



Fig 4 Experimental Setup

In order to identify the true behaviour of MRR, five process parameters each at three levels have been considered for this study is shown in Table 1. A set of three levels assigned to each process parameter with two degrees of freedom (DOF) as per Taguchi experimental design philosophy. This gives a total of ten DOF for five process parameters selected in this work.

The process parameters Electrolyte concentration, Machining Current, Machining Voltage, Duty Cycle, and Frequency are studied in this investigation with each parameter having two degrees of freedom. As per the standards of Taguchi methodology, 7 degrees of freedom assigned for Error. Thus we have a total of 17 DOF for the factors as well as the interactions considered for the present experiments. The nearest three level orthogonal array available satisfying the criterion of selecting the OA is L₁₈ having 17 DOF [21]. The layout of experiments designed using Taguchi Design methodology has been furnished in Table 2.

TABLE 1 PROCESS PARAMETERS AND THEIR LEVELS

Factor	Electrolyte concentration	Machining Voltage	Machining Current	Duty cycle	Frequency
Level 1	0.1	3.5	0.1	33.33	30
Level 2	0.2	5.0	0.3	50.00	40
Level 3	0.3	6.5	0.5	66.66	50

The process parameters Electrolyte concentration, Machining Current, Machining Voltage, Duty Cycle, and Frequency are studied in this investigation with each parameter having two degrees of freedom. As per the standards of Taguchi methodology, 7 degrees of

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TABLE 2: EXPERIMENT LAYOUT USING L₁₈ ORTHOGONAL ARRAY

Exp. No	Levels of Process Parameters				
	Electrolyte concentration	Machining Voltage	Machining Current	Duty cycle	Frequency
1	1	1	1	1	1
2	1	2	2	2	2
3	1	3	3	3	3
4	2	1	1	2	2
5	2	2	2	3	3
6	2	3	3	1	1
7	3	1	2	1	3
8	3	2	3	2	1
9	3	3	1	3	2
10	1	1	3	3	2
11	1	2	1	1	3
12	1	3	2	2	1
13	2	1	2	3	1
14	2	2	3	1	2
15	2	3	1	2	3
16	3	1	3	2	3
17	3	2	1	3	1
18	3	3	2	1	2

The levels of process parameters are selected based on the research done by various researchers and based on the pilot experiments conducted for this research work. The levels of process parameters selected based on the Taguchi's design methodology for Nickel to fit L₁₈ orthogonal array is given in Table 3.

TABLE 3 ORTHOGONAL ARRAYS OF PROCESS PARAMETERS

Exp. No	Electrolyte Concentration	Machining Voltage (Volts)	Machining Current (Amps)	Duty cycle (%)	Frequency (Hz)
1	0.1	3.5	0.1	33.33	30
2	0.1	5.0	0.3	50.00	40
3	0.1	6.5	0.5	66.66	50
4	0.2	3.5	0.1	50.00	40
5	0.2	5.0	0.3	66.66	50

6	0.2	6.5	0.5	33.33	30
7	0.3	3.5	0.3	33.33	50
8	0.3	5.0	0.5	50.00	30
9	0.3	6.5	0.1	66.66	40
10	0.1	3.5	0.5	66.66	40
11	0.1	5.0	0.1	33.33	50
12	0.1	6.5	0.3	50.00	30
13	0.2	3.5	0.3	66.66	30
14	0.2	5.0	0.5	33.33	40
15	0.2	6.5	0.1	50.00	50
16	0.3	3.5	0.5	50.00	50
17	0.3	5.0	0.1	66.66	30
18	0.3	6.5	0.3	33.33	40

VII. RESULTS AND ANALYSIS

Experimental Results

The ECMM experiments are conducted with brass wire tool of 250 microns diameter for Nickel. In order to achieve proper circularity of machined holes, the anode tool is properly ground. The test job specimens are kept uniform in size of 50 mm × 25 mm × 0.15 mm. The ECMM experiments were conducted twice in each combination of process parameters to study its effect over MRR. From the trial 1 and trial 2 experiments, the average MRR is calculated and tabulated for Nickel in table 4. It can be seen from the experimental results of Nickel, the obtained MRR ranges from 0.001369 to 0.009577 mm³/min, while the dimension deviation stood between 11 and 31 microns.

Dimensional Deviation

In this work, the main emphasis is given for studying effects on process parameters on MRR and Dimensional Deviation (DD). A comparative study on the effects of process parameters on MRR Vs DD is made and the outcome is detailed hereunder. In order to easily compare the MRR and corresponding DD obtained is plotted on logarithmic scale for Nickel as given in Figure 5.

TABLE 4 EXPERIMENTAL RESULTS

Exp. No	Material Removal Rate (mm³/min.)	Dimensional Deviation (microns)
1	0.001632	29
2	0.002123	13
3	0.006307	20
4	0.001839	21
5	0.004033	22

6	0.006703	14
7	0.002874	25
8	0.009577	20
9	0.003226	14
10	0.003724	25
11	0.001369	11
12	0.004675	31
13	0.004807	22
14	0.004402	14
15	0.001880	23
16	0.003931	15
17	0.003393	14
18	0.006546	15

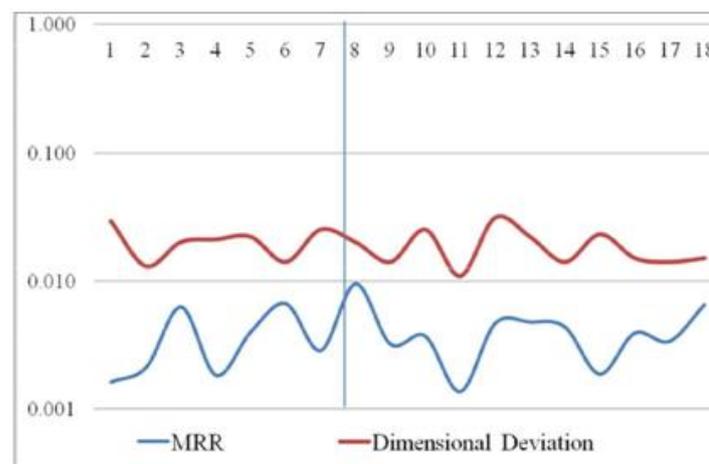


Figure 5 MRR Vs Dimensional Deviation – Nickel

Optimization of Machining Parameters

Data pre-processing value of the each individual objective (power consumption and surface roughness) is obtained by using one of the Eqs. (1), (2) and (3) depending on their type of quality characteristic. Calculate the grey relational co-efficient by using Eq (4). The value for ξ is taken as 0.5 in Eq. (4) since all the process parameters are of equal weighting. Computed data pre-processing value for each individual objective and their grey relational coefficient are shown in Table 5.

Next, the grey relational grade can be computed using fuzzy logic analysis. Grey relational coefficients of MRR and DD are taken as input to the fuzzy model and the output is grey-fuzzy reasoning grade. Graphical representation of developed fuzzy logic model using MATLAB 2007b is shown in Figure 6. In this study the most popular defuzzification method is the centroid calculation, which returns the centre of area under the curve. The defuzzifier can convert the fuzzy value into non-fuzzy value which is called as grey-fuzzy reasoning grade. The membership function adopts in this is trapezoidal membership function which has a flat top and really is just a truncated triangle curve. The responses for the machining process have been designed as membership function of the developed fuzzy

model shown in Figure 7. There are five fuzzy sets for variables of grey relational coefficient of MRR and DD: very small (VS), small (S), medium (M), large (L), and very large (VL). The same way output variable grey-fuzzy reasoning grade there are nine fuzzy sets shown in Figure 8: tiny (T), very small (VS), small (S), small medium (SM), medium (M), medium large (ML), large (L), very large (VL), and huge (H).The fuzzy rules in a matrix form used for the fuzzy logic are shown in Table 6.

TABLE 5 THE DATA PRE-PROCESSING OF EACH INDIVIDUAL OBJECTIVE (MRR AND DD) AND THEIR GREY RELATIONAL COEFFICIENT

Ex.No	Data Pre-processing-MRR	Data Pre-processing-DD	Grey relational coefficient - MRR	Grey relational coefficient - DD
1	0.0320	0.1000	0.3406	0.3571
2	0.0919	0.9000	0.3551	0.8333
3	0.6016	0.5500	0.5566	0.5263
4	0.0573	0.5000	0.3466	0.5000
5	0.3246	0.4500	0.4254	0.4762
6	0.6499	0.8500	0.5881	0.7692
7	0.1834	0.3000	0.3798	0.4167
8	1.0000	0.5500	1.0000	0.5263
9	0.2262	0.8500	0.3925	0.7692
10	0.2869	0.3000	0.4122	0.4167
11	0.0000	1.0000	0.3333	1.0000
12	0.4028	0.0000	0.4557	0.3333
13	0.4189	0.4500	0.4625	0.4762
14	0.3695	0.8500	0.4423	0.7692
15	0.0623	0.4000	0.3478	0.4545
16	0.3121	0.8000	0.4209	0.7143
17	0.2466	0.8500	0.3989	0.7692
18	0.6307	0.8000	0.5752	0.7143

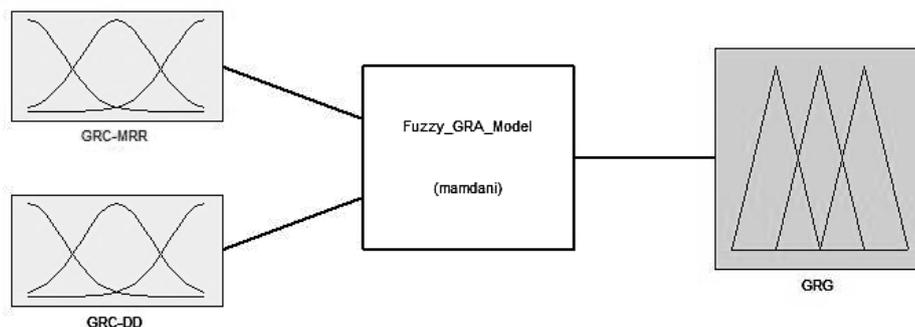


Figure 6 Developed Fuzzy logic model for ECMM responses

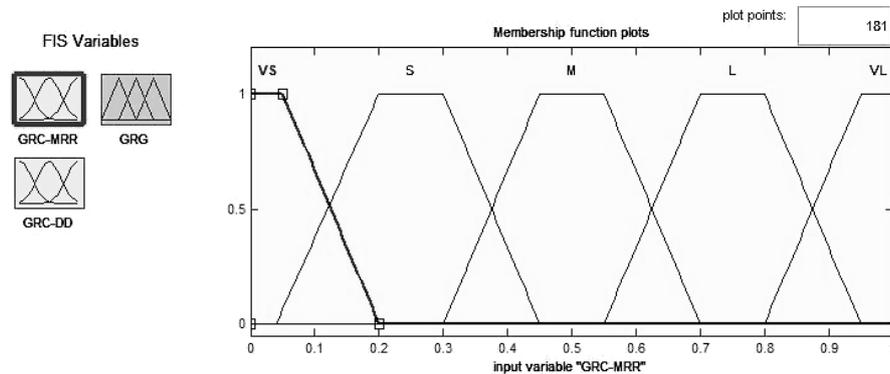


Figure 7 Membership function for MRR and DD

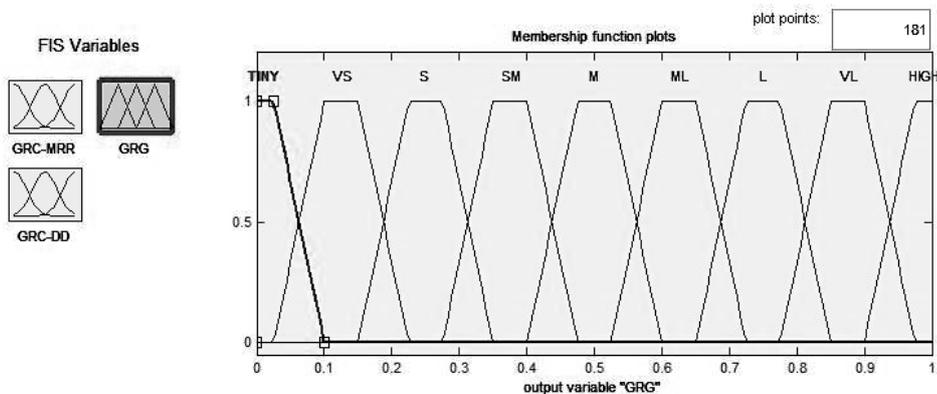


Figure 8 Membership function for grey-fuzzy reasoning grade

TABLE 6 FUZZY RULE FOR GREY-FUZZY REASONING GRADE IN A MATRIX FORM

ECMM Process: grey-fuzzy reasoning grade rules		Membership functions for grey relational coefficient of MRR				
		VS	S	M	L	VL
Membership functions for grey relational coefficient of DD	VS	T	VS	S	SM	M
	S	VS	S	SM	M	ML
	M	S	SM	M	ML	L
	L	SM	M	ML	L	VL
	VL	M	ML	L	VL	H

Graphical representation of fuzzy logic reasoning procedure for Exp 11 result of L₁₈ orthogonal array is shown in Figure 9, in which rows represents the 25 rules, and columns are the two inputs and one output variable. The locations of trapezoidal indicates the determined fuzzy sets for each input and output value. The height of the darkened area in each trapezoidal corresponds to the fuzzy membership value for that fuzzy set. For Exp 11, the input value of grey relational coefficient of MRR and DD are 0.3333 and 1.0 respectively. The defuzzified output for the Exp 11 gives the grey-fuzzy reasoning grade value as 0.656 from the combined darkened areas shown in the last column of Grey-fuzzy-grade in Figure 9. The entire results of the calculated grey-fuzzy reasoning grade for the experiments are shown in Table 7. Finally, the grades are considered for optimizing the multi objective parameters selection.

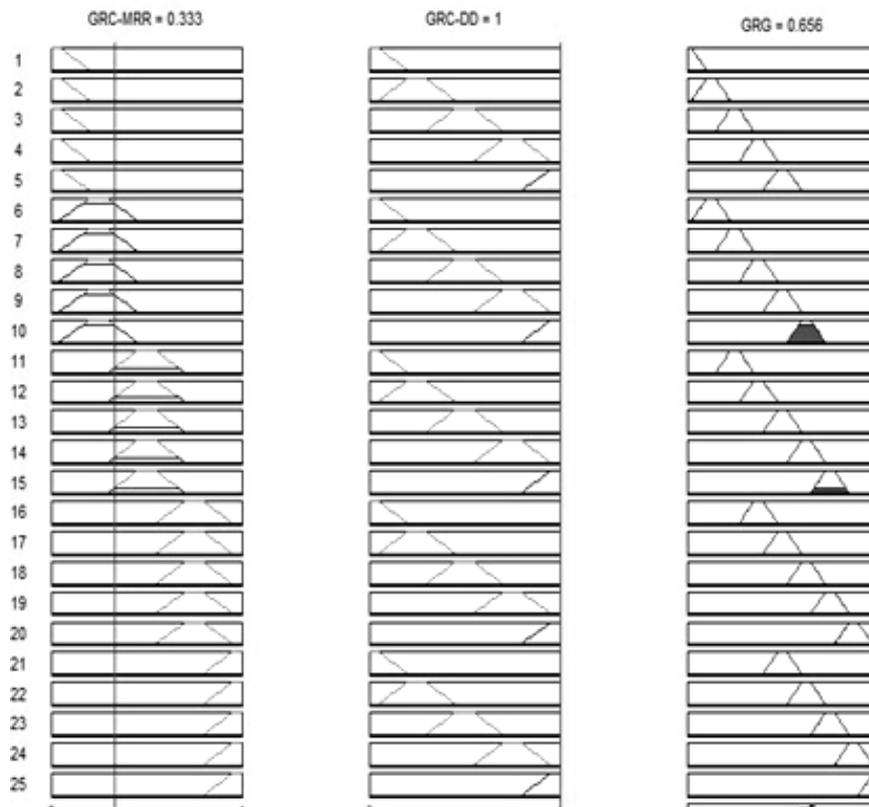


FIGURE 9 Fuzzy Logic Rules Viewer For The Model Exp 11

TABLE 7 GREY-FUZZY REASONING GRADES AND THEIR RANKS

Ex.No	Fuzzy-GRGrade	Rank
1	0.3430	18
2	0.5860	7
3	0.5070	10
4	0.4160	15
5	0.4760	12
6	0.6600	2
7	0.4060	16
8	0.7500	1
9	0.5750	9
10	0.4250	13
11	0.6560	3
12	0.4060	16
13	0.5000	11
14	0.6170	5
15	0.4170	14
16	0.5980	6
17	0.5800	8
18	0.6490	4

From the value of grey-fuzzy reasoning grade in Table 7, the main effects are tabulated in Table 8 and the factor effects are plotted in Figure 10. Considering the parameter level with higher value of mean grey-fuzzy reasoning grade for each individual parameter in

Table 8 and Figure 10, the optimal parameter conditions $A_3B_2C_3D_1E_2$ is obtained. Using the grey-fuzzy reasoning grade value, ANOVA is formulated for identifying the significant factors. The results of ANOVA are given in Table 9. From the ANOVA results, it is clear that Machining Voltage (39.50 %) influences more on ECMM of nickel followed by Electrolyte concentration (19.91%), Machining Current (18.87%), Duty cycle (6.31%) and Frequency (5.50%).

TABLE 8 RESPONSE TABLE FOR THE GREY-FUZZY REASONING GRADE

Parameter	Level 1	Level 2	Level 3	MAX-MIN
A	0.4872	0.5143	0.5930	0.1058
B	0.4480	0.6108	0.5357	0.1628
C	0.4978	0.5038	0.5928	0.0950
D	0.5552	0.5288	0.5105	0.0447
E	0.5398	0.5447	0.5100	0.0347

TABLE 9 RESULTS OF THE ANALYSIS OF VARIANCE FOR THE GREY-FUZZY REASONING GRADE

Factor	DOF	SS	MS	F-Test	F-Table	% Contn
A	2	0.0442	0.0221	7.13	18.50	19.91
B	2	0.0877	0.0439	14.15	18.50	39.50
C	2	0.0419	0.0210	6.76	18.50	18.87
D	2	0.0140	0.0070	2.26	18.50	6.31
E	2	0.0122	0.0061	1.97	18.50	5.50
Error	7	0.0220	0.0031			9.91
Total	17	0.2220				100.00

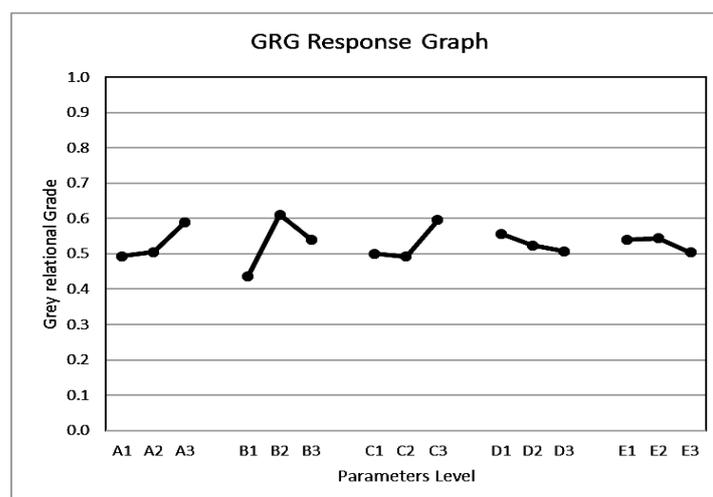


Figure 10 The response graph for each level of ECMM parameters

Confirmation Test

The optimum level of process parameters has been determined by using S/N ratio values (higher-the-better). Once the optimal level of the process parameters has been selected, the

final step is to predict and verify the improvement of the performance characteristic using the optimal level of the process parameters. The purpose of confirmation test is to validate the conclusions drawn from analysis of experimental results. The predicted or estimated GRG (η) using optimal levels of process parameters can be calculated with the following equation;

$$\eta = \eta_m + \sum_{i=1}^q (\eta_i - \eta_m)$$

η_m - Total mean of GRG

η_i - Mean of GRG at optimum level

q – No. of significant parameters

After predicting the response (GRG), a confirmation experiment has been designed and conducted with the optimal level of the machining parameters to verify the improvement of performance characteristics is shown in table 10.

TABLE 10 THE COMPARISON RESULTS OF INITIAL AND OPTIMAL TURNING PERFORMANCE

Initial turning parameters	Optimal turning parameters	
	Prediction	Experiment
Levels A ₁ B ₂ C ₂ D ₂ E ₂ MRR (mm ³ /min.)0.002123 DD (microns) 13	A ₃ B ₂ C ₃ D ₁ E ₂	A ₃ B ₂ C ₃ D ₁ E ₂ 0.00914 15
Grey-Fuzzy reasoning grade 0.5070	0.7705	
Improvement of grey-fuzzy reasoning grade	0.2635	

VIII. CONCLUSION

The effects of process parameters and the optimum cutting parameters for ECMM process on the multiple objectives are systematically investigated by grey relational analysis and fuzzy logic with orthogonal arrays. The following conclusions are obtained Approach of grey based fuzzy logic analysis was a productive method for optimizing the multi-objectives such as MRR and DD in ECMM of nickel. In the results of ANOVA, it is revealed that machining voltage, electrolyte concentration and machining current are predominant factors which affect the ECMM of Nickel. Machining voltage (39.50 %) influences more on ECMM of nickel followed by electrolyte concentration (19.91%), machining current (18.87%), duty cycle (6.31%) and frequency (5.50%). The best performance characteristics were obtained with optimal setting A₃B₂C₃D₁E₂. Through the optimum procedure of grey-fuzzy logic with orthogonal arrays, the level constitution of optimal cutting parameters are acquired and verified by confirmation test. The results proved that the multiple objectives are improved simultaneously by using this approach.

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Design a machine learning algorithm to predict the rent of a property using AWS and cloud computing

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Sandeep Bhargav**

Abstract: - Future preparations are the key to success. The essential part of the land search, since there is a backup reserve for emergency repair to plan the right rental fare. While preparing for what it will hold for the 2019 rental market. The trends that are coming in 2015 and how you can make the best preparation for them are as follows. So we've built a cloud-based rental analysis method using machine learning that enables them to detect a rental pattern in a particular area. Online rental applications are not only convenient for potential tenants, but they are also more practical for you as a landlord. The online application protects you from collecting information, losing applications, mixing applicant information and being responsible for sensitive personal information. In the world that is increasingly on security, online rental applications can provide you with the option to identification paper copies.

Keyword: House Rent, Property price, cloud, AWS, Machine learning

1. Introduction

Machine learning has been used over the years for image recognition, spam detection, original commentary understanding, product suggestion, and treatment diagnosis. Today, the machine learning algorithm can help improve our cyber security, ensure public safety and improve medical results. Machine learning system can make customer service better and automobile safety. Machine learning is the practice of building systems, which are known as models, which can be trained using data to look for patterns that can then be used to predict new data. A significant difference is that the machine learning model is not a rule-based system, where 'if / then' is used for a series of predictions (for example, 'if a student misses more than 50% of classes, they fail automatically'). Rather, it is the one where the statistical relationships we used to know about the past examples of what we are predicting and then applied to new data. Where your house is sold, and you are trying to ask the price. You can look at other homes that you recently sold in your area, and find that you're most familiar. Every house you look at is known as an observation. When you are trying to find the same room, you can see the size of the house, how many bedrooms and the bathroom they have. You seem to feature every feature of these features. Machine learning

Through learning, the process of acquiring knowledge can generally be defined. We started the process of learning new things from people born. This learning process continues throughout our lives, where we try to gather more knowledge and try to improve the experience we have learned through experience and the information gathered around us.

Artificial Intelligence (AI) is a field of computer science that aims to create a system that performs tasks and displays intelligent behaviour. A system can be considered intelligent without any human intervention and if it learns to play an action relating to a defined

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process without proper precision. A sub-field of Machine Learning (ML), AI is a matter of concern that the algorithm and the evolution of strategies for the computer's permission, understanding and evaluation ML intertwines with other statistics such as statistics, human psychology, and brain modelling. Psychological psychology and neurological models derived from brain modelling help to understand the process of human brain activity, and especially its learning process, which can be used to form the ML algorithm. Since many ML uses data analysis to create algorithm models, statistics play a significant role in this regard.

Knowledge increases the size or size of the body, making it difficult for people to determine the new relationship between the information generation processes (domain). ML tries to create computational models that accurately and efficiently represent computers from the algorithm domain and knowledge base. The built-in model captures the process of domain generation and uses this model to match the previously stunning examples of algorithm domain.

Each example consists of a set of input attributes and an output feature. Input features are informational responses to the information and output attributes provided in the Learning Algorithm. The value of the output attribute depends on the benefits of the input attributes. In addition to the amount provided in it, the feature defines a property, which creates the properties vector of an element. The model generated by an algorithm can be seen as a function that maps the input properties as a value to the output quality.

Much information may be random when seen in a naked eye, but in close examination we can find patterns and relationships in it. We get insight into the process of data production. With and Frank [2005] Data Mining is defined as the process of data mining data discovery. It is known as the process of extracting relationships from the given information. A different model from general data mining machine learning is considered with the model learning function. Among the data mining issues, we can see the data generation process as information created by domain and knowledge base. Therefore, ML algorithms can be used to learn a model that describes the process of data generation based on given datasets. The information provided by the algorithm for the model is called training information because the computer is trained to learn from this information and the result model of the learning model. This model can now be used to predict or classify previously invisible examples. The new case used to evaluate the model is called a trial set. The goal of the test set can be assumed that the accuracy of a model from the difference between the value prediction and the actual quality can be estimated.

Forecast forecasting can be considered as an example of data mining. Using weather data collected from a location for some time, we get a model for predicting variables such as temperature based on the input of the model. Following weather conditions follow patterns and not completely random, we can use current weather readings with readings taken at nearby locations, as well as in some places, a few hours before forecast location. In this way, examples used for model creation are examples of the dynamic features mentioned in one of these positions for the current location - Previous and previous hour readings may appear from a set of nearby locations as input attributes. For example, the types and conditions of the covered conditions depend on the variability that we are trying to predict and use in the features of the ML algorithm.

1.1.Problem Definition

We present a model that can predict London housing prices in the future. Select a response method, explore and compare different response methods. We take advantage of the local structure of dataset to distribute computations in small independent local models. The overall forecast is achieved by recombining predictions from the regional model. Programs predict about modelling and server-side applications, we can focus on offline computability intensive tasks and create client-side visualizations. Our results show that our approach to the problem has been very successful and other housing prices could create competitive forecasts for prediction models.

2. Literature review

Computer learning is a branch of artificial intelligence, which aims to develop strategies that allow computers to learn. More firmly, it is able to create algorithms for generalization behaviour and to identify patterns from the information provided in the example form. So, it is the process of bringing knowledge, that is, a method that allows general statements of general statements. When all separate cases are observed, induction is considered completely, so it is believed that the generalization of that growth is valid. Obviously, it is impossible to achieve full integration in most cases, so the statement is raised, subject to a specific degree of uncertainty, and so consideration cannot be considered as a valid plan or cannot prove the validity of the experience. In many cases, the field of the machine is covered with the field of data mining, because the two disciplines concentrate on data analysis, but machine learning gives more attention to the complexity of their implementation problems from their computers. See the real point, not only the theoretical. At the basic level, we can say that one of the functions of AA is to try to extract knowledge about some inert features of an object based on the properties of the same object (or features shown in others). Or, in general, predict the future in the future based on what has happened in the future. For example, a very current model in the future determines whether the customer will prefer the customer based on the desired rating.

In some cases, the first thing we learn about what we're talking about is:

Education: After solving this idea, we want to give a simple method of self-education production, providing a way to measure the success / failure of our knowledge. In any case, we are transferring an intuitive concept and we usually use it in a computational context of everyday life, it should be considered that we measure the numerical point of view as well as various forms of measurement, which are closely related to close points and relate to a spontaneous close relationship and we tried to learn Abe.

The general definition of education in the human context can be as follows: research, experience, guidance, logic and observation of results, skills, knowledge, behaviour or quality can be achieved or corrected. From this definition, it is necessary to know that the environment must be learned from experience, not to be based on all knowledge or knowledge of education, which is achieved through the normal or normal growth of the person. Following similar projects, we can learn from the experience of the machine at AA, learning from its experience, a method that is not from the recognition of priority program. Therefore, how to implement this definition of computing is to understand the central function (for example) using different types of recommendations (for example) recommendation systems, for example, to add specific customer / product pairs, to evaluate the machine experience through the object. Have).

We have a large number that fall into the learning connection. The main differences between them are trying to predict that they are trying to predict. Some common classes are:

Feedback: They try to predict an actual value. For example, the behaviour of bags (time) predicts the price of the pack within the stipulated time. Or a student grade prediction of final exam based on the grade obtained from various jobs performed during the course.

Classification (binary or proprietary): They try to predict the classification of the class of a set of predefined categories. For example, when certain news, sports, entertainment, politics, etc. are classified, only two possible courses are organized, but this is called binary class; if more than two classes are approved, we are talking about ownership classification.

Ranking: Try to predict the best sequence of a set of objects according to the predefined relevance. For example, a search engine provides Internet resources in response to user searches.

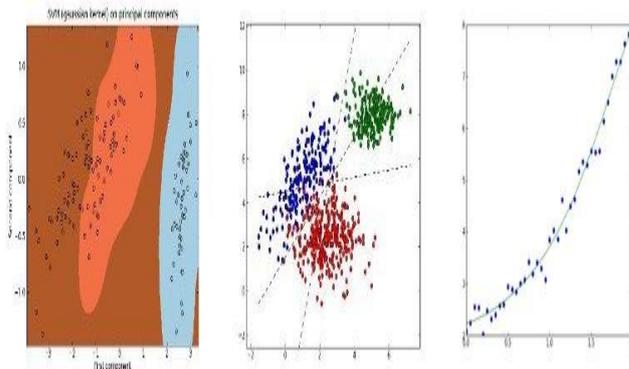


Fig 1: Data Distribution and processing in machine learning

In general, when a new AA problem is solved, the first thing is to identify one of the previous classes, depending on whether it is classified, that method which we can measure error in prediction and reality. As a result, in order to estimate how successful learning is achieved, treatment should be treated in every particular area, although in general, we can expect that we have a measurement of "embedded" in our place.

On the other hand, and depending on how the type of production and treatment of the example is mentioned, different AA algorithms can be grouped by:

Learning under supervision: A function is created, which establishes a connection between the input and output of the system, where the knowledge of the network consists of pre-labelled examples (for example, we recognize their proper classification). An example of this type of algorithm is the classification problem we mentioned earlier.

Uneducated Education: Modelling is done only on a set of examples created by system input, without identifying just the right information. So the system can detect new patterns to enable labelling patterns.

Semioverrified Education: It considers the combination of two algorithms, both classified and non-approved.

To learn reinforcement: In this case, the algorithm observes the Earth around it and provides continuous information from sides (from the earth to the machine and from the computer to the earth), an experimental and error process and the world reciprocates a positive reaction

Translation: It is similar to learning under supervision, but its goals are not explicitly forming a function, but only in the following examples, examples of example examples, related sections and new examples try to predict those categories. That is, it will be close to the idea of adequate supervision.

- Multi-task learning: Includes teaching methods to face the difficulties encountered in the system previously taught.

1. Recommended model

Based on the Gaussian process model, we discuss the design and implementation of our predicted system for rental housing prices. How the dataset is being created, implementation languages and libraries are used for training of dataset and how it is predicted according to the project's requirements.

3.1 Data Collection

Data Collection: To prepare the dataset for prediction system, some changes have been made:

1. In order to capture the geographical changes of the housing prices more accurately, we decided to represent latitude and long-term property rather than the postcode. This is suitable for neighbouring regions, which basically share the same postcode compared to a postcode

2. This process is automated with a Python script, which shows a postcode of pre-compiled CSV files from London Postcodes and provides the corresponding letter and length.

Since January 1995, our transaction date has been introduced since January 1995 (the first month of our dataset transaction), which makes it easy to present only a few months and a few months instead of year.

Binary class variables (build and expiration) are represented using a binary number (i.e., 0 = 0, 0 = old, 1 = new / (time) 0 = child, 1 = freehold), when the property type has three binary numbers is presented using.

3. Using dummy coding [43] (for example 000 = separate, 100 = semi-dry, 010 = roof, 001 = flat).
4. Thousands of quality qualities are often quoted; we have surrounded our dependent variables with the nearest thousand, which also helps in the numerical stability of the model.

3.2. Use the data set

Due to the large number of data points (2.4 million) of data, a GP model training using the entire dataset will be completely ignored. However, the size of our dataset should be limited to 104 above the upper limit, which means that less than 1% of the entire dataset, which is inevitable. In this way, we will use the concepts distributed in our prediction models, use our datasets and provide a way to combine local models. The exploitation of specific features of our datasets makes the idea of using local models much more. To create a local model, we have shared datasets in multiple subsets by location. It will draw a square grid on the map. And group the data points in a box on the subset. Each subset of the training will be done independently. In spite of our dataset section, we still face the problem of having an incomplete number of data points among different subsets. There may be a dataset with 10,000 data points in the central London area, when there is a dataset below 100 data points in areas outside of central London. Regardless of the granularity of the square grid, it will be effective in the number of data points on each subset and maintain the upper bound. Finally, the number of data points is used, granularity and training are taken, and we propose to extend lengths length of 1km length to 50 x 100 sq.

GB where the subsets are low and high, 200 and respectively 2,000 data points respectively. Subscriptions with the following data points below will not be considered in our model below the border.

4. Training of data

Using the following methods, we will provide information on the data network using the Radial Basis Function Network.

Radiologists Basis Function Network [Bohemian and Albany, 2003; Orr, 1996] another kind of forward-forward neural network. It has three layers: input, hidden and output level. The hidden layer unit separates from an MLP in the process of counting. An RRF network can create both feedback and classification models. We will describe the regression model. In one Arabic information, inputs are mapped to each hidden unit from the input level. The Secret Group uses radial functions for activation Gaussian, multi-quadrilateral, inverse-multi centric and Kochi [and, 1996]. WEKA's RBF network [with and Wang, 2005] uses the Gaussian function of the bell-size. Activating the Gaussian function for given input x (x) reduces the distance between Gaussian and X growth centers somewhat. The Gaussian function is effective for detecting hidden unit activation, inputs can be activated depending on their intimacy in the center of an unknown group, and thus can be used as an effective method for the separation of contributions. Gaussian function form

$$H(x) = \text{"exp"} \left(\frac{- (x-c)^2}{r^2} \right).$$

The output layer takes the linear coordinates of the output from the hidden unit and corresponds to a regression model. For our weather model, an RFF network will be shown in Figure 2.9.

It takes input and hidden units as an RBF network point. The activation of the unknown group represents the input value and the distance between points that represent the location of the unknown unit. Distance converter

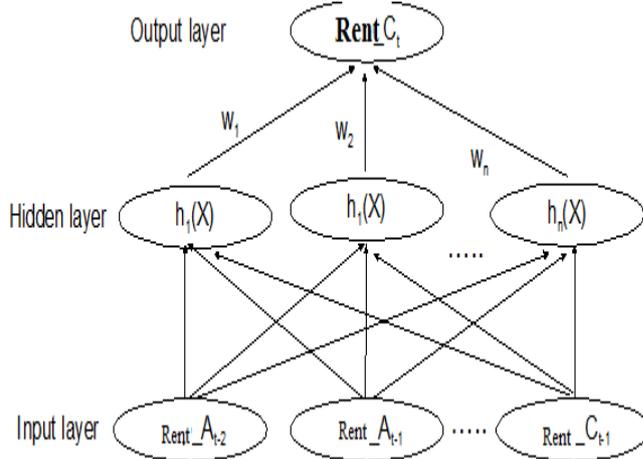


Figure 2: An ARBF network with N hidden unit to predict the temperature at a site. X network and output are given input vectors.

Rent_Ct is the sum of the products of the activation of hidden units and their associated weight. Each secret group has its academic center.

Measurement of similarity by the Gaussian function. The space point for the hidden unit is obtained from the center of Gaussian for the undercover unit. Gaussian's width is also a learned parameter.

Evolution

Assessment we have been directed to create a rental house price forecast application that has met the primary purpose of this project. However, the final product alone does not measure the performance and effectiveness of our project. In this chapter, we will evaluate the quality of our prediction system; see the efficacy of the forecasting system, and the effectiveness of the application.

Predicting Method: To measure the quality of our GP based prediction method, we use Root Average Squared Errors (RMS) and mean predictive log possibilities (MPLL). RMSE is defined by the square root of the two squares (average * $y^* - f(x^*)$) in the ratio and the actual values of each test point in our validation set. Under the MPLL model, the probability of each test input log prediction is defined by the average.

GP produces a Gaussian Prophecy Density; the log is defined as the predictive chances of $\log p(y^*|D, x^*) = -\frac{1}{2} \log(2\pi\sigma^2) - \frac{(y^* - f(x^*))^2}{2\sigma^2} + \text{const}$, where $\sigma^2 = \sigma^2 * + \sigma^2 n$, Respectively prediction and word variant sum. We independently trained each subset of data, and we will calculate the average of RMSEs and MPLL across the entire Gulf, and use them as a comparison between different prediction methods. The results of various methods were presented at table 6.1. Out of the results, it is clear that choosing our prediction method using GP is ideal for us because it offers the lowest RMSE and maximum MPLL. To determine our model competition, we compare the error estimates.

Remove outliers from the dataset

Monitoring points that are outgoing from other observations. For example, my data contained a house with an area of 50 square meters worth \$ 500. These types of houses may be in the market for a variety of reasons, but they are not statistically significant. I want to estimate a price based on the market average, and so I will not take such extra steps in the account.

Most response methods need to be expelled out of the dataset because they can significantly affect the outcome. I have used the following functions to remove the outgoing:

```
def get_outliners(dataset, outliers_fraction=0.25):  
    clf = svm.OneClassSVM(nu=0.95 * outliers_fraction + 0.05, kernel="RBF", gamma=0.1)  
    clf.fit(dataset)  
    result = clf.predict(dataset)  
    return result
```

This will return -1 for outliers and 1 for non-outliers. Then you can do something like this:

```
training_dataset = full_dataset[get_outliners(full_dataset[analytics_fields_with_price], 0.15)==1]
```

Then, you only have non-external monitoring. Now it's time to start the regression analysis.

3.1 Select a response algorithm

There are several ways to analyze feedback. The best prediction accuracy given by our information is that we are looking for. But how can we check the accuracy? A common way to calculate a so-called r^2 score is that a square difference between a real and predictive quality. It is important to remember that if we use the same dataset to learn and verify accuracy, then our model can be blocked. It will display excellent accuracy in a given dataset, but it will fail after new data is supplied. A common method to solve this problem is to split the original dataset into two parts and then test it for testing and use it for the other. In this way, we will follow the new information for our learning model and if we have any object we can spot it.

We can share our datasets using the 80/20 ratio. We will use 80% for training and the remaining 20% for the exam. Let's take a look at this piece of code://code for algorithm quality estimation

```
//code for algorithm quality estimation
from sklearn import svm
import matplotlib.pyplot as plt
from sklearn.neighbors import KNeighborsRegressor
from sklearn.linear_model import LinearRegression, LogisticRegression
from sklearn.svm import SVR
from sklearn.metrics import r2_score
from sklearn.cross_validation import train_test_split
from sklearn.ensemble import RandomForestRegressor
import pandas as pd

#prepare dataset
#...
#split dataset
Xtm, Xtest, Ytm, Ytest = train_test_split(training_dataset[analytics_fields], training_dataset[['price']],
                                        test_size=0.2)

# model = RandomForestRegressor(n_estimators=150, max_features='sqrt', n_jobs=-1) # случайный
#ec
models = [LinearRegression(),
          RandomForestRegressor(n_estimators=100, max_features='sqrt'),
          KNeighborsRegressor(n_neighbors=6),
          SVR(kernel='linear'),
          LogisticRegression()
          ]

TestModels = pd.DataFrame()
tmp = {}

for model in models:
    # get model name
    m = str(model)
    tmp['Model'] = m[m.index('(')]
    # fit model on training dataset
    model.fit(Xtm, Ytm['price'])
    # predict prices for test dataset and calculate r^2
    tmp['R2_Price'] = r2_score(Ytest['price'], model.predict(Xtest))
    # write obtained data
    TestModels = TestModels.append(tmp)

TestModels.set_index('Model', inplace=True)

fig, axes = plt.subplots(ncols=1, figsize=(10, 4))
TestModels.R2_Price.plot(ax=axes, kind='bar', title='R2_Price')
plt.show()
```

Fig: 04 code for algorithm quality estimation

As a result, I got the following graph:

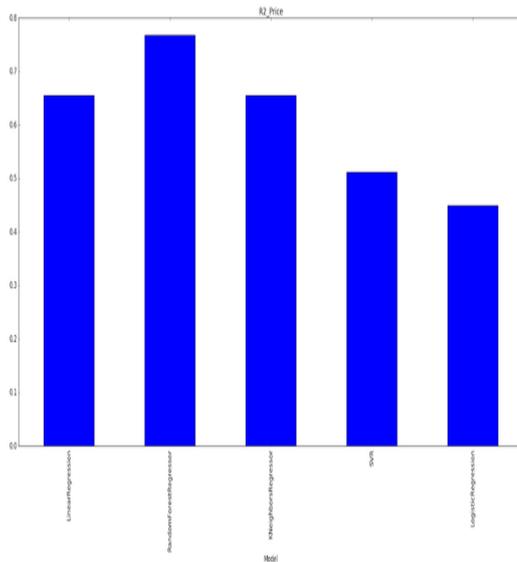


Fig 5: Random forest response shows the precision Conclusion

As you can see, the random forest response shows the precision, so we decided to use this algorithm to produce. Production cost assessment works much like our test code, no $\wedge 2$ calculations are needed and switch models now. At this time, we can predict fair prices. We can compare the real value of a house with our predicted value and keep deviations. Look at my home price forecasts project. I've designed housing analysis from an undeveloped devaluation. Naturally, my house price forecast algorithm is not 100% accurate. But this is acceptable for me because my primary goal is to create a custom ranking that can reduce the amount of manual work for those who buy or sell homes and compare prices in the market. An ARF network is trained to learn the centres of hidden units and the width of Gaussian functions and then adjust the weight of the feedback model used in the output unit. The K-Medium clustering algorithm can be used to learn at the Gaussian function center, which can use clusters for training Gaussian functions for every aspect of the instant. If the Gaussian function parameters are found in secret units, the output units of this unit are coordinated using linear response. The process can be repeated to learn an EM method.

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Development of Personalised health monitoring system using Machine learning and AWS cloud computing

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Abstract:- Health care is an essential aspect of daily life, necessary for the health and wellbeing of the population due to human resources and affordable care. Even so, continue to increase the corresponding costs for medical services. A contribution to health care growth costs is waste and fraud. In particular, with the rapidly expanding growth in the United States, the use of wearable devices such as smart gears and other wearable devices has implemented new health care monitoring programs and implemented health care telemetry. But machine learning is taking a step forward, which allows doctors and relatives to keep an eye on the health of the elderly family members. These algorithms used to understand the user profile, which enables potential health discrimination before health care professionals. Create models for personalized health profiles and monitoring. This method is critical to reducing health risks. Even using Medicare data, many studies do not provide adequate details about data processing and integration, which makes it even more difficult for challenging to understand the test results and for the revival of the test. In this thesis, we present the current research using Medicare Data, focusing on data processing and integration and defining a gap in the information-related details. We present discussions on essential information to see how to look at how to process and merge different Medicare datasets by suggesting opportunities to work in the future.

1. Introduction

It is a fact that the global population is growing and growing [1], [2]. Due to these demographic changes, chronic infectious diseases such as congestive heart failure, dementia, sleep apnea, cancer, diabetes and chronic respiratory, pulmonary disease [1], [3], [4]]. Besides, the total number of people suffering from some disabilities (which is related to living, or traumatic, or chronic conditions) will increase. [5] Besides, 65% of the people aged 85 and 50% of the age of 50% of the population fall each year [6], [7]. For this population, health care costs are increasing [8], the quality of life and productivity is decreasing, and in many cases, the family members work as primary care assistants. As well as challenges to effectively manage and treat post-progressive rehabilitation patients, people with disabilities and special abilities, these issues show the need for new and innovative ways to provide health care to patients. In response, information and communication technologies are expected to offer means to offer personalized, low-cost and citizen-centric health care solutions to solve predetermined challenges. [9] Recent advances in sensor communication, sensor detoxification, and microelectronics have enabled health care providers to monitor and manage chronic diseases and identify possible emergencies [10]. Health monitoring in the home environment can be done either by two or both of the following [11]:

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1) To record physiological signals and ambulatory monitors using wearable sensors and devices

2) Sensors are unwantedly embedded in the home environment and home furnishings to collect behavioral and physiological data. Among the researchers involved in Dementia and other chronic conditions, the positive effects of attention and attention technology have been confirmed [12]. Moving one step further, diagnosing primary health and diagnosing serious health changes most of these problems can be prevented, billions of dollars are saved annually [13], [14]. Primary detection, however, requires continuous alerts. Due to the nature or training of their condition and lack of experience, many of these populations have become depressed or can make a difference that cannot detect and report critical observations. The primary methods of addressing this problem are to keep track of patients with health care professionals directly or through relatively crude and heavy physiological data collection devices. These types of devices and sizes, which include various cables and need to be immune to the patient to achieve reliable measurements, are not irrelevant when public, uncomfortable, long-term and low-cost health surveillance are inappropriate. However, the new generation's cheap, uncomfortable wearable / replaceable devices [15] can move towards initial and automatic detection of severe changes to the patient's health status. In this context, such devices should not be just simple data collection, nor should they report variations from sample demographic values only. Instead, they should be able to utilize the advanced data processing algorithm and diagnostics to discover different user baselines and to understand the dangerous health trends better and, as a result, to inform medical professionals for further assistance. These wearable systems should be engineered to integrate portable devices operated by first responders and integrated stable-system systems in hospitals. As a result, these devices will continually capture data, it will organize in customized patients, and condition models and each patient's unique information will be first reactionary and contact with hospital staff. On this paper, we present our perspective on establishing a useful framework for the novel, interactive and intelligent wearable health-monitoring prototype, which is known as Prognosis. The rest of the paper is organized as follows. The second section will give a brief insight into the Affordable Health-Monitoring System (WMIMS) and decision-assistance process. The third section will represent the overall concept of the proposed system based on the current availability of generic architecture and wearable biomass. Article IV, the combination of recommended physical information, will give details of the combination technique, its operating model and a formal definition of formal examples. At Section V, we provide an SPN-based model of the interaction scheme between the user and the system.

2. Literature Review

[1] The authors have described that the development of wearable sensor technology continues and plays a major role in the development of human health services, giving them opportunities and progress which helps in adjusting food consumption and energy consumption technology and becomes a partner for the people. Accessibility of technology has now reduced the barriers for low power computing and networking. Recent advances in wearable sensor technology help to monitor the movement of the neck and head injuries and the environment. The sensor integration system is done in the health information collection system. Information integration and explanation play a key role. The wearable sensor helps to monitor the behavior of physical and technical flexibility in its

environment. The goal is to utilize the wearable sensor, processor, and progress to show the study of the behavior of animals and humans in their neutral environment.

[2] Due to the vowel, due to the vowel, the author describes the frustration in the real world of signal signals, which reduces system performance in speech recognition. The hidden Markov model is used to rebuild the spoken components of the spectral, whose functionality is reduced by the unwanted acoustic noise. Construct Markov chains using the random process Markov property during discrete. In each level, there is an isolated state among the potentially limited states of nature. The number of techniques does speech Parameter Frequency Domain Encoding Speech Analysis. The signal is characteristic precisely. The nature of the strategy is that the speech recognition system is distributed. Incredible spectrum data is reconstructed for the recognition of robust sound lecture by Hidden Markov model.

[3] The authors have described that the systems available at present are very low-level living behavior monitoring and accuracy. This is also the reason behind the poor understanding of overweight and obesity ETIOLOGY. Studies have shown that the frequency of intake can be used to predict food intake. The separation of the liquid and solids can be completed, and the mass can be ingested. The system offers two approaches, and this method is used to detect acoustic acoustics from words and words corrupted by the comparison. The result shows the high efficiency of proposed methods in the separating sound from the artwork. This handmade head is derived from the movement, words, food involved. The accuracy of the system is not related to the body mass index. This system looks suitable to be used by the gross person.

[4] The author describes obesity research which is now a big problem. Due to the increase in awareness of public obesity-related diseases, pandemics cannot be understood. The ongoing scientific debate is subject to several views of the etiology of obesity and strong different opinion. The reason for obesity as changes in physical activity as our diet and lifestyle change. Powerful words of research made by popular media publications like Time Magazine the topic of debate is increased by research this summary. This paper focuses on people's relationship with weight control and energy consumption equations in humans. Etiology insight grows by understanding obesity. Technology is developed to measure the material of the energy equation accurately.

[5] Authors have been describing information about taking a significant diet of the person involved in using body sensors. This system is helpful to help weight loss professionals develop personalized programs for clients and to research nutrition information and eating behavior. Maintaining the balance of food consumption and spending energy in daily life is very important for long-term health. According to the World Health Organization, the number of peacocks is 700 million. Manual methods and automated solutions are used to capture the behavior of eating a person. The proposed system broadens the full self-reporting solution using the universal sensor. It simplifies the current manual monitoring techniques which are incompatible with the current manual reporting techniques. Manual logging is replaced. ADM system offers a self-report. Daily schedules are maintained for food use.

[6] The authors describe incentive behavior using chewing and melting non-invasive observation to study behavioral patterns of weight and volume and energy assumptions. This method has been improved. Non-invasive monitoring using bone absorption microphone or sound sensor consumes is detected. In this method, the first two methods

are used; the sensor-based system and second protocol are used for manual scoring and intake of chewing gum and chewing. The key to maintaining a healthy lifestyle is to maintain the balance between healthcare and energy costs. To monitor the observance of greatness and noninvasive targets, sensor hardware and hardware-based systems are developed to obtain reliable information from sensors. Chews and Swallows are used as a standard for automatic pattern recognition scores. These systems are obtained which result in high quality of high reliability and readability information.

[7] The lecture description for the author's recognition of speech and recognition of speech describes the use of various discrimination attributes of the element. Using the AdaBoost method from the larger features pool, discrimination properties can be removed. Use this extruded feature set in data-driven methods. This lecture can be recognized by listening to non-lecture helps improve performanceperformance. Ad Boost based algorithm is used to select a feature set from the larger features on the proposed system. Research interest in detecting acoustic events is increasing rapidly. Although the source of lectures may sound useful information other words. Acoustic events can occur in many different ways. So identifying literary events helps to describe social and human activity in their environment.

[8] The authors described how to define predefined categories in free text documents automatically; text categorization is the main problem. The number of documents available online is quite difficult without a document retrieval index. Solving this problem is document categorization. The new and advanced machine learning techniques are applied in text categorization. Feature The space document contains different words and phrases. For reducing the purpose of text categorization. Feature space selection can easily be easy to categorize text in applications like neural networks

3. Proposed Model

We can combine measurements in a structured and meaningful way by creating a mathematical model for each measurement regarding others. Consider leaving a compressor exhaust pressure. It is influenced by moderate temperature, machine rotation rate, medium structure, and several other parameters. It is possible to calculate what the pressure should be, to let these parameters know. To count it, we need to find out the relation between these parameters in our mathematical form.

Forming this equation from expert knowledge is very time consuming since this equation will be different for each model of the model and model of the machine and each condition of the device. For real-life purposes, if it can be achieved with the speed of the model and very few people, it is OK to do it.

This machine learning:- These methods receive experimental experiences that are measured on this specific machine when it was known as healthy. From this data, machine learning methods create mathematical representations of the relationships of all the parameters around the computer automatically and without human effort.

It can be mathematically proved that a neural network can accurately represent a complex data set, as long as the system is sufficient and the data consistently follows the same laws [1, 2]. The machines are following the requirements of nature, and these ideas are easily correct. We use a neural network as a template for modeling each measurement on the device regarding others. The machine learning algorithm finds the value for model parameters such as neural networks that accurately represents the data.

It is important to consider selecting a measurement when a specific measurement modeling can be done automatically. We use coordination of mutual modeling and core material analysis to do this. [1]

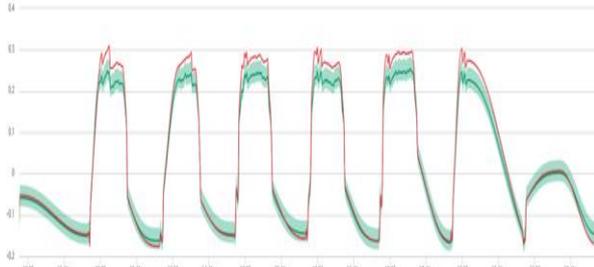


Figure 1: The displacement of the Central Axle of the compressor is measured (green) of the model (green) and the model (green) of the model (light green).

It is seen that the model also model the model of the model while the load changes and model loads of both the load and the low. We keep a deviation between each load model and measurement while reaching full capacity. It is a hint of a mechanical problem and will be cautious.

As a result, each measurement on the machine gets a source that can calculate the expected value for this measurement. The formula was trained on information known as healthy, and this formula is a health definition for this machine. The disadvantage is then considered to be the deviation from health. See Figure 1 for an illustration.

It is essential to find out the model of health and deviations from it because much information is available for health, general conditions and normal healthy behavior. Preferably, little information is available for unhealthy public response, and this small amount is very diverse due to the host of different failure modes. Differences between the making of each of the machines and the failure modes for the model are very complicated. Analysis of poor health modeling data is a problem, but information availability is not a problem. As such, this problem is fundamental and cannot be tackled in a real and comprehensive way.

Scary

At any one time, we can compare the expected strong value of the sensor value. Since the expected value is calculated from a model, we know the probability distribution of deviations, i.e., how much the measurement measure of a certain amount can be, see Figure 2. So we can calculate the health feasibility of this distribution, or in contrast, use this confidence level to judge whether the sensor value is far from healthy. If this case is available, an alarm is sent.

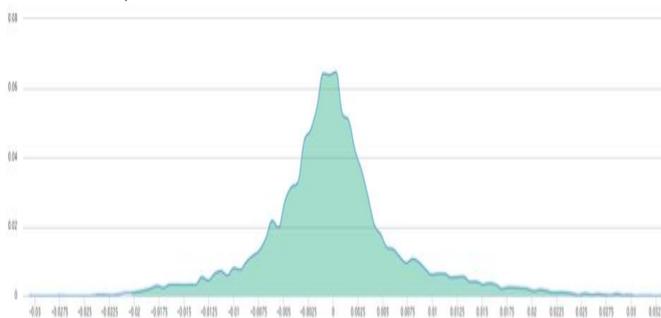


Figure 2: Deviation between the probability (vertical axis) of the deviation in the model and the sensor value (horizontal axis)

We hope to have a bell-shaped curve for a good model, as there are several points with little deviation and several deviations in the above and below differences of the models, with overall parallelism. From this distribution, how quickly we can read any observation deviation and how healthy a measurable state is. This image translates directly to a sensor measurement of a health index.

By providing the possibility of poor health, how the state offers insufficient information can be enriched. Since the expected value is counted from the number of other machine parameters (usually small), it is generally possible to blame any other measurement. To help solve this problem and design some steps, improve the human engineer receiving alarms.

Along with observing the normal condition, it is often found that when a machine is moved from one stable position to another, many (false) alarms are released because the simple analysis method can not conform to the rapidly changing conditions. A neural network could easily represent highly non-linear relationships; even if the startup or load change of a machine were also everything, it would be modeled correctly without the alarms.

4. Results

This system has been thoroughly testing for rotating types of machinery like compressors, pumps, gas and steam turbines from different manufacturers in the operational context of power generation, chemical production, oil refining, and production. In particular, company man diesel and turbo, this method uses alarms in its compressors and gas turbines to see human engineer data once.

Our partners have observed in practice that due to the automatic support of machine learning methods, the human effort has been reduced to set up and maintain a system monitoring method of more than 50%. It is predominantly generated automatically as each measurement is mainly due to the above and the lower limits carefully not for carefully.

False alarms (false positives) and missing alarm (false negative) have exceeded the event rate of 90%. This reduces human engineering efforts to diagnose machine flaws by cutting 60%, reducing maintenance budgets and improving machine availability by about 10%.

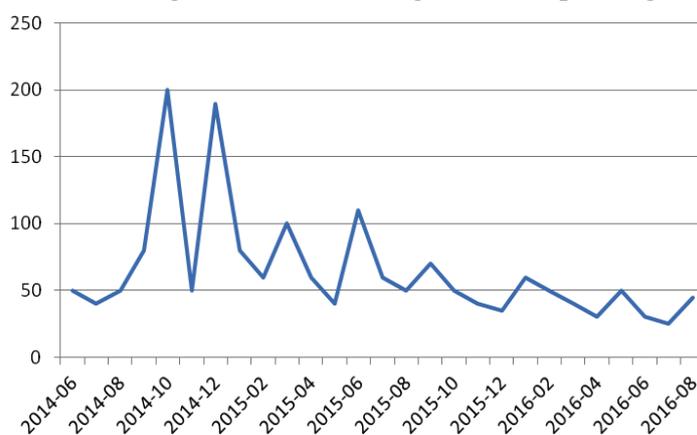


Figure 3: An example of the maintenance budget over time with thousands of US dollars. Over time, due to less responsive and more active maintenance, the budget size decreases.

Conclusion

The institution adopts new methods, maintains less responsive and more active. This saves money in various ways. As a result of the consecutive trip to the plant, we identify

problems before, to prevent any parallel damage completely. Potentially lost production is reduced. The cost due to order to push both people and materials is also avoided. Of course, the real problem must be repaired, but it can now be designed in a predefined way, in opposition to a firefighter mode. It can reduce a maintenance budget as 50%.

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Analysis of pesticide by Smart Farming System using machine learning algorithm over AWS Cloud

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Abstract: -Smart Farm is a crop management system that allocates crops to the farmers by the highest requirement, which predicts through their machine learning the appropriate crops for their area according to soil, type, mean rainfall, and pesticides, etc. That crop is not wasted and, accordingly, is not produced subsequently. There are two applications for a mobile app for end users, such as a web application for farmers and administrators. We are planning to create a hybrid mobile application 'Smart Farm' which will allocate crop to every farmer who registers this applicant. If the farmer agrees with it, then the amount of money that will be paid to them will be corrected. This will encourage their allotted crops to grow. Statistical information is available in a particular crop quantity per year, and with the help of those figures, it is possible to determine the amount required in next year, but with little precision (this will enable us to maximize the amount of each crop needed for the future). Also, if all crops are available in abundance, then the prices will be low, and this will benefit the poor sections of the society who cannot afford to buy such expensive food grains.

Introduction

Technology, however, helps these farmers reduce costs. Your farms are connected wirelessly. Moisture detectors around each of the plants monitor what happens in the soil. They send their observations to a computer in the cloud to be analysed and, depending on the needs of the plant, the irrigation system of the farm solves these deficiencies. This irrigation system resembles the hydroponic culture used in greenhouses. Every half hour, a quantity of calibrated water, based on the calculations made by the server in the cloud, and mixed with the appropriate amount of fertilizer falls on each plant. This drip is deposited in the two parts of the trunk of the plant, since experience has shown that absorption is better. Before this system was available, it would have been watered at least once a week. With this new technique, 20% less water is used than used to be used. This means saving money and water. This type of farms and some similar ones that grow other fruits such as pistachios, nuts and grapes are known as "smart farms". But not only nut farmers are those who take advantage of these benefits. Row plantations, such as corn and soybeans, which cover a large amount of Central West America, are also using this type of technique. Planting, irrigation, fertilization and harvest are automatically controlled. Even the soil on which they grow is monitored. Farms are becoming more and more like factories: highly controlled operations to get reliable products, immune as much as possible to the vagaries of nature. The times have gone by when we had to rush out in the middle of the night to a farm field to monitor the temperature and humidity of the crops. Nowadays, a farmer only has to take his Smartphone, press some keys and go back to sleep in his bed. And that,

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thanks to a technology known as "smart farm" ("smart farm"). The applications of this technology work with the Internet of Things (IoT), and through them are measured and analysed temperature, humidity and intensity of sunlight in a greenhouse. The data thus obtained is sent to a smartphone, or a desktop computer, for farmers to review and control the conditions of the greenhouse in real time.

As soon as they began to be used, these new systems have made it possible to increase the productivity and quality of crops, while reducing the use of labour and energy consumption.

We plan to make a hybrid mobile application 'SMART FARM' that will **assign crops to every farmer** who registers on that application. If the farmer agrees upon it, then the amount that will be paid to them will be fixed. This will encourage them to grow the allotted crops. The statistical data on the amount of a particular crop consumed every year is available and with the help of those stats, it is possible to determine the amount that will be required in the next year, not exactly but with a precision to some extent (it will give us the upper bound on the amount of each crop needed in future). Also, if all the vegetables are available in ample amount, then the prices will remain low, and this will **benefit the poor sections of the society** who were not able to afford to buy such costly food grains.

Registrations of Farmer

Phase 1: -Registration of Farmer

The Farmer registers himself on the application by entering the following details:-

Name of the farmer, Age, Aadhar Number, Contact Number, Land Area (Hectare), Village, District, State

Phase 2: Detail Updation in the database

After submitting all the information relevant to the farmer, the registration will be done by the application. Then the farmer will save his data database.

Phase 3: Crop Selection

Farmers with a list of suitable crops will be shown based on the following factors:

- Land area - Each crop yield is different, and so it is essential to decide which type of crop is most suitable.
- Types of soil - Weather, black, iron, clay, etc. based on soil. The best suitable crop will be selected for the soil that is given.
- Rainfall - Rainfall in the region is affected by crop yield. Depending on the land geographical location, the crop will be selected.
- Crop requirement - Real-time crop will be given priority with higher cost rates.

Phase 4: Crop Allotment

Based on crop cultivation, he wants to cultivate, he will be asked for confirmation, and if he ensures the same increase, he will be given an allotment ID. This allocation ID will be sent via SMS.

Phase 5: Updating Crop Requirements

After informing the farmers about the crop, he has agreed to cultivate, the details of the crop allocation will be updated in the database. Also, the new crop requirements will be updated by increasing crop yield in the farmers' land area at the first stage of the old need.

Phase 6: Verification of farmer and crop

After allocation of 15-20 days of the crop, one representative officer will visit the peasant and verify the details of the farmer. If all the features provided by the farmers are correct

and the farmers cultivate agreed crops, then the advance amount will be presented to facilitate the further requirements of the farmers.

Phase 7: Collection of crop and paying off the remaining amount

Once the crop is fully grown, the farmer will get the remaining amount, and the crop will be collected from him, and the market will be outsourced.

Technical Details of the Project

- ❖ **Mobile Application** - Ionic Framework and AngularJS
- ❖ **Web Application** - HTML/CSS, AngularJS
- ❖ **Database** - Firebase real-time database
- ❖ **Machine Learning** - python, pandas, scikit-learn (Linear Regression), matplotlib and mpl3d
- ❖ **SMS API** - Textlocal
- ❖ **Server** - Host web app
- ❖ **Training data** - <https://data.gov.in/node/87630>

Features of the project

- ❖ **Easy Navigation:** This application doesn't require any purchases means it is **free of cost**.
- ❖ **No Ads:** This application does not contain any advertisements.
- ❖ **Multi-Platform:** This application can quickly run across **multiple platforms** and provide easy and **convenient** access to the user, who has little or no knowledge of how to use an app.
- ❖ **Notification:** Whenever a farmer registers himself on the mobile application, and agree to cultivate the crop allotted to him, then after successful submission, the farmer will be notified about his successful presentation through a text message.
- ❖ **24X7 Access:** By using the **real-time database** (Firebase), we provide the farmers the flexibility to register themselves on the application whenever they want themselves to express.
- ❖ **Admin:** The **admin dashboard** details of the farmers will be built in such a way, that as soon as a new user registers themselves on the application, the admin will be able to see all the details of the farmers including their district, village, land area and allowed crops in real time.
- ❖ **Predictive Crop Allotment:** The farmers will be allotted crops **according to their soil type, average rainfall, soil texture and soil color** in their district and most importantly the crop with the maximum requirement that can be grown in that area.
- ❖ **Real-Time Crop Requirement Updation:** As soon a crop is allotted to a farmer the **requirement of that will be updated accordingly** by subtracting the amount that can be grown in the land they have from the original specification.
- ❖ **Interactive Plots:** The admin will be able to interact with the **plots of the requirements of the crops** over the years and the predicted requirement of the crop.

Closed loop irrigation solution for farmers

Fossil field plays an essential role in crop production. However, how much and when it can be sprinkled is still restricted by the traditional knowledge of the peasants. For a given soil type, for a given crop it is necessary to know precisely how much water is required to keep

the humidity depend mainly on the power of the soil. We need an IOT, AI-based solution that can irrigate the fields of crops based on soil moisture content automatically

- Seventy percent of the water has been consumed and most of the wasteful use of farmer's account. Farmers are central to the whole picture, where they are the world's most miserable place of poverty.
- Agriculture cannot be ignored in the water equation, and it is the essential part of the developing world.
- A country like India, with a tropical climate, disagrees with its diversified region, today experiences a flawed pattern which depends on farmers to be a significant source of irrigation.
- The state's estimated irrigation potential is 5.1 million hectares, which is 3.1 million hectares already achieved. The gap of 2 million hectares cannot be fully solved by fully absorbed land water.

Proposed Solution

- Our model is responsible for obtaining information related to location, time and weather conditions (mostly on rainfall) and during one interval, the irrigation system will be automated according to soil moisture required.

When working with varieties of weather types, different weather and season variation, the model facilitate movement.

- It is all done while reminiscing the possibilities in the remote areas even to the farmers.
- It is designed to take advantage of the soil humidity sensor, humanity, temperature, and rain sensors to provide a smart watering system for users with existing soil systems. All climate activities will be managed by an intelligent controller that will be able to collect information and allow users to adjust the quantity and timing of the water supply based on those readings.
- Our Smart Controller integrates users into existing Sprinkler systems so that users can remotely control their home irrigation through a web interface or an Android interface.
- The data collected by the sensor is sent to the cloud-generated database for further processing and predicting future weather conditions.

Methodology

Stage 1: Creating an admin application (web application).

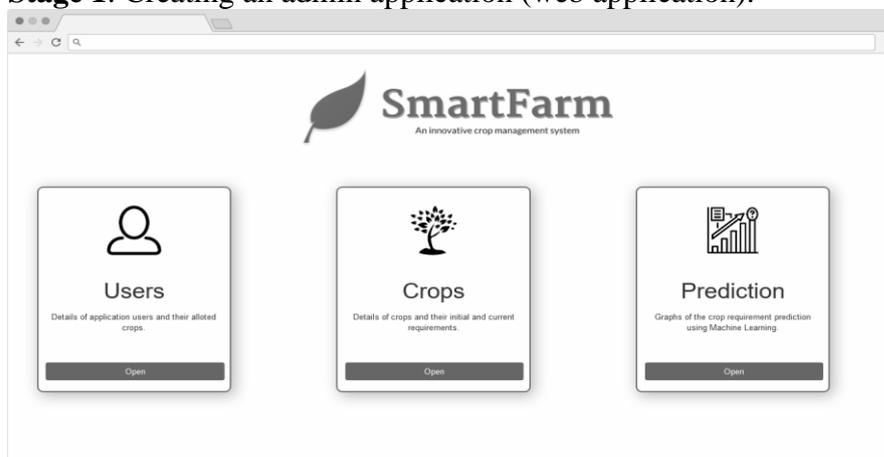


Image1: Prototype of Smart Farm Admin Web App Interface

Stage 2: Gathering the essential data like soil fertility, feasible crops, atmospheric conditions, annual rainfall of every region in the state.

Stage 3: Design a hybrid mobile application that will gather farmer details.

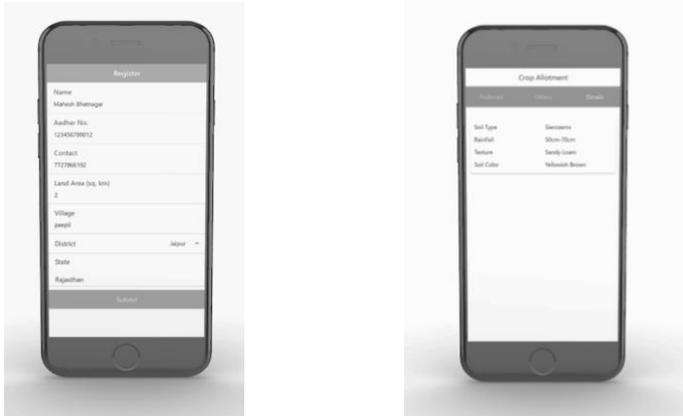


Image2: Prototype of Registration Form Image: Prototype of Soil and Weather Attributes



Image2: Prototype of suggested crops

Stage 4: Register the application on the Play Store and Apple App Store.

Stage 5: Update the details of the farmer in the database and reflect the changes on the web app.

Stage 6: Creating banners and campaigns for creating awareness among the farmers.

Methodology

The farmer will register himself on the application and after we have all the relevant details, which we will use for crop allotment based on geographic conditions and previous year consumption statistics.

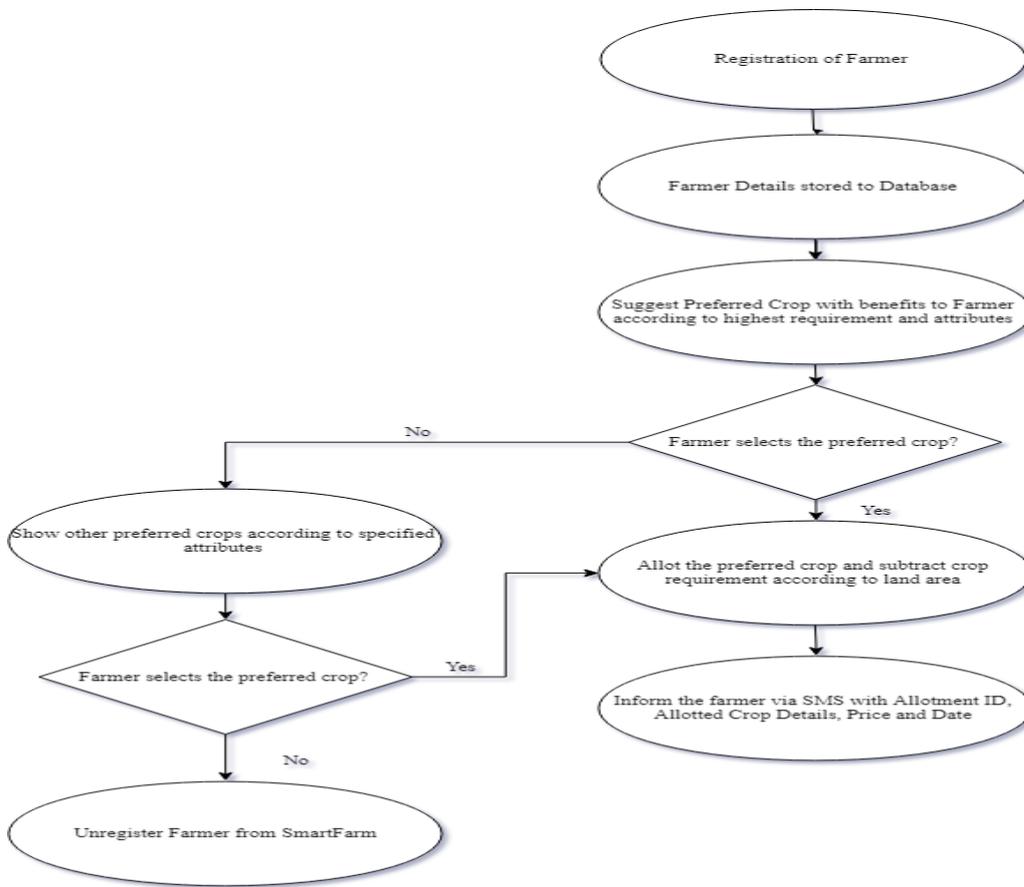


Fig: Flowchart for the Process of Crop Allotment

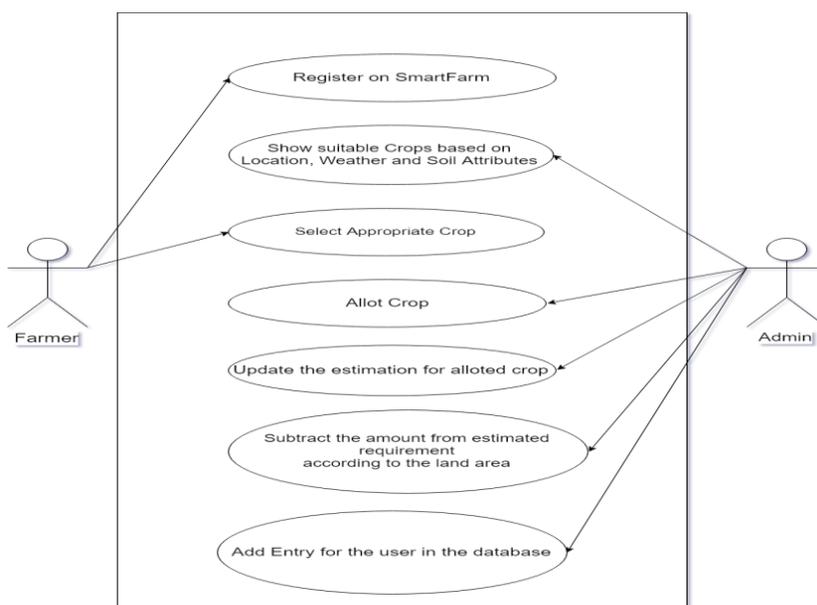


Image 3: Use case diagram for Smart Farm

Conclusion

Our solution to this problem will be an innovative crop management system for farmers and the government. In 'this tool, we **predict the average (upper bound) consumption of several types of crops by Machine Learning** using the open source data of crop production and consumption of previous years. Through this precisely accurate prediction we will assign a crop and amount of it to be grown to each farmer, following the following factors -

1. Soil type of area
2. Average rainfall in the area
3. Soil texture

If the farmers linked to the tool grow the assigned crop, they will be provided with the designated price for it, and the crops will be raised in the desired amount.

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The development of a 'new set of skills' using AI and machine learning in the Amazon Alexa to improve learning

Nitish Rasgotra*

Sandeep Bhargav**

Summary:- The rapid development of thought to (IOT) Integrated network of contacts object. Analysts predict that the cumulative annual growth rate (CAGR) by 2020 in the global market of 16.9% (IDC, 2015) will be. Gartner predicts that 25% of households have an intelligent virtual assistant in 2020 (with a tax of \$ 1.7 billion) will be two or more devices on the public use of laptops, smart, intelligent devices, etc. Personal digital data amount that will provide a great source of digital data. Echo Amazon.com review recommends changes in the way of technology; the use of more than half the name Alex, but most technology items refers to pronouns. When names and pronouns are considered together, users are almost equal between each person and, at least any customization; twenty percent of personal characteristics have been committed in the language. Personality differences and explains the user, these results suggest that the size of the character changes among users because of the reasons for further investigation, for example, expectations of social robots and emotional model. The maximum description of the interaction with socialization echo / Alexa lower and middle level. These results suggest that the size of the character changes among users because of the reasons for further investigation, for example, expectations of social robots and emotional model. The maximum description of the interaction with socialization echo / Alexa lower and middle level. These results suggest that the size of the character changes among users because of the reasons for further investigation, for example, expectations of social robots and emotional model. The maximum description of the interaction with socialization echo / Alexa lower and middle level.

1. Introduction: In the latest research, police officers, lawyers and forensic experts tried to use detection devices devices such as "always" based on IOT, as individual black boxes. In particular, there is a recent criminal case in which the echo of Amazon, has received much attention the media attention. In November 2015, another accused James Bates in the first row, who died arrest in a bubble bath. Police in Arkansas Alexa ultrasound avoids smart homes and required to carry all the relevant information about the device ALA. However, rejects the absence of a request for Amazon for a valid and legally binding. There are many legal questions about such use of evidence, but there are important considerations. Even more important, to test efficiently in this case, you must first understand the characteristics of the digital ecosystem faces Alexa and Amazon. When Alex is active, Amazon Eco is not only an intelligent speaker, but acts as an intelligent virtual personal assistant. As a cloud service, interacting with different compatible devices, such as Alexa Eco and services, the native IO protocol voice icon can control and communicate with a third party that is compatible with other devices and

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applications. To mount the environment in relation to Alexa, users have access to cloud services business, such as computers or mobile devices (Android and iOS devices). Thus, these interconnected devices, third-party applications, customers and partners are complex and diverse ecosystems (Amazon) created by this work, namely, Alexa, and its ecosystem. When Alex is active, Amazon Eco is not only an intelligent speaker and also works as an intelligent virtual personal assistant. As a cloud service, Alexa can communicate with various compatible devices, such as Alexa Echo, and connect to other devices and iOS third-party applications. To mount the environment in relation to Alexa, users have access to cloud services business, such as computers or mobile devices (Android and iOS devices). Thus, these interconnected devices, third-party applications, customers and partners are complex and diverse ecosystems (Amazon) created by this work, namely Alexa and its ecosystem. When Alex is active, Amazon Eco is not just a clever speaker, but acts as an intelligent virtual personal assistant. As a cloud service, Alexa can communicate with various compatible devices, such as Alexa Echo, and connect to other devices and iOS third-party applications. To mount the environment in relation to Alexa, users have access to cloud services business, such as computers or mobile devices (Android and iOS devices). Thus, these interconnected devices, third-party applications and client partners are complex ecosystems (Amazon) in this work by Alexa Alexa can contact a variety of suitable devices, such as local computer protocols and ultrasound. Compatible with other devices and applications. To mount the environment in connection with Alexa, Users access the need for enterprise cloud services, such as computers or mobile devices (Android and iOS devices). Why Amazon creates all these interconnected devices, third-party applications and complex and diverse ecosystems favorable to the client. In this paper, Elko can communicate with different types of compatible devices, such as echo, and other devices and applications that can communicate with a third party. Native communication protocol puts IO voice services. To mount the environment in relation to Alexa, users have access to cloud services business, such as computers or mobile devices (Android and iOS devices). That's why all interconnected devices Amazon, third-party applications, and customer-friendly complex and has created diverse ecosystems. In this introduction, customers have access to a service company in the cloud, such as a computer or mobile devices (Android and iOS). Thus, these interconnected, third party applications and partners client devices are complex and diverse ecosystems (Amazon) created by In this feature, and customers access to a service company in the cloud, such as computer or mobile (Android and iOS) devices needed. That's why all those Amazon creates interconnect devices, third-party applications, and complex and diverse ecosystems for the customer in this work, all these interconnected devices, third-party applications and complex and diverse ecosystems of customers created by Amazonas . In this work, all these interconnected devices, third-party applications and diverse ecosystems (Amazonas) and complex music. We offer a new method for cloud and client-side digital masters Alexa for the ecosystem of the Amazon are mixed. Acquisitions handmade Alexander native cloud is important. Alexa ultrasound works, so manual user interaction is different in the cloud. Unfortunately, this approach has two limitations. First, access to the cloud requires a valid user. Of course it is possible to access data through research or research, but this information is not always available. Second, it is difficult to restore deleted data in the cloud. Forensic approaches are needed by the client to overcome this limitation. It felt As a result of our analysis, a concept is presented, the test equipment

based on solid IOT cloud environment: Kit Forensic cloud-based tools, IOT, which can reach objects in the cloud, to benefit from API nonprofit Indiana and implement customer - sided analysis of artifacts. Use a web-based application. We try to get all the work that is detected in the normalization of the database and support our work and support the work of digital forensics community. Current procedures and provide system IOT situation require at least useful for testing concepts and imaging tools that work in the Amazon environment Alexa. Voice service based on Amazon Amazon Amazon is available on Amazon devices and third party devices million. With Alex, we can more intuitive way to interact with customers to create the daily experience forms provides natural voice. Our team, APIs, reference solutions and document collections make it easy for everyone. Begin construction of a speech by adding new energy Alexa combines directly combining alcohol or product unit Alexa the voice control device is here and the time to embrace this technology in the classroom. Alexa Punto Amazon operates at low cost via Wi-Fi, can make your classroom into an interactive learning where students use voice search to display the class, as their future home and vehicles. In addition, the children love! With Alex, we can more intuitive way to interact with customers to create the daily experience forms provides natural voice. Our team, APIs, reference solutions and document collections make it easy for everyone. Begin construction of a speech by adding new energy Alexa combines directly combining alcohol or product unit Alexa the voice control device is here and the time to embrace this technology in the classroom. Alexa Punto Amazon operates at low cost via Wi-Fi, can make your classroom into an interactive learning where students use voice search to deploy the class, as their future home and vehicles. In addition, the children love! With Alex, we can more intuitive way to interact with customers to create the daily experience forms provides natural voice. Our team, APIs, reference solutions and document collections make it easy for everyone. Begin construction of a speech by adding new energy Alexa combines directly combining alcohol or product unit Alexa the voice control device is here and the time to embrace this technology in the classroom. Alexa Punto Amazon operates at low cost via Wi-Fi, can make your classroom into an interactive learning where students use voice search to deploy the class, as their future home and vehicles. In addition, the children love! Reference solutions and document collections make it easy for everyone. Begin construction of a speech by adding new energy Alexa combines directly combining alcohol or product unit Alexa the voice control device is here and the time to embrace this technology in the classroom. Alexa Punto Amazon operates at low cost via Wi-Fi, can make your classroom into an interactive learning where students use voice search to deploy the class, as their future home and vehicles. In addition, the children love! The kind of interactive learning in which students use voice search to deploy the class, as their future home and vehicles. In addition, the children love! The kind of interactive learning in which students use voice search to deploy the class, as their future home and vehicles. In addition, the children love! The kind of interactive learning in which students use voice search to deploy the class, as their future

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2. Use of Alexa

2.1 The basic classroom management

Amazon reserves the time and only the standard management class. Do not say: "Alexa", the device captures the attention. For example, you can say, "Alexa, the timer for ten minutes" and the unit will begin operations over time. It occurs randomly in random groups of students, any association or group. If you have to make decisions quickly, Alex "Teja head." demand

I use writing and Amazon can not tell the story of the story, but if you have a public account, Amazon works directly with Alex, you learn to read their novels on the basis of a high level group. You can use your skills to improve your writing skills. Alexa may explain the high number of words. Definition and synonyms audio device can this tool is especially useful as a second language for English language learners.

maths

Amazon may simply be a numerical calculation, addition and subtraction. Instead, you can use these tools to "identify" their math students. Moreover, Alexandra has many tools, "says Roll.

Science is a search, because you can use Amazon Alexa. Depending on grade level, ask questions Alexandra time, animal or human body. There are tools like Alexa and Finance Science Science News headline.

History and social sciences

The device works well for civics and history lessons. In addition to the daily press conference, there are historical events and history. It can be used for geography, if the question "What is the capital of Georgia?" If the United States is playing the capital

extra fun

Amazon can be used for fun. The device can play music, podcasts and games. If you have time, you can try different games like triangle "Jeopardy", or you can use the music while the gym is an independent student.

2.2. Why Alexa is able to build skills

Alexa is that ultrasound devices based Amazon cloud-based voice Amazon and equipment, equipment, fire fighting, fire tables, and third-party tools used. You can create knowledge or skills that make it faster, more comfortable and more enjoyable for customers making. Alexa Kit (ASK) is a collection of self-service APIs, tools, documentation and code samples, enhanced abilities used by thousands of developers skills. With ASK everyone can enjoy voice design knowledge for a quick and easy to build on Amazon. Building rebuild your voice customer experience for today

You can share your experience Alexa voice

Natural creation with the ability to achieve sound and access to the customer experience with devices. Use our SD shows, APIs and codes for games, expert skills for children, content skills, musical skills and more. Provide well-trained skills to develop and distribute entertainment habits

Add visual and tactile characteristics

Maintain visual experience for the design, construction and creating the first visible voices, ultrasound programs, ecological points, fire TVs, tablets and more types of devices, such as Alexa skills to spend more. Create games with eco buttons and maintain an ultrasound device in one of the interactive games.

Alexa money

De vaardigheden van het meisje met klanten zijn gebouwd, Klanten winnen you. Nu kun je geld verdienen met je kracht Alexa Om uw ervaring verbeteren you go door to aankoop vaardigheden, verkopen inhoud van hoge kwaliteit, verkopen Alexa vaardigheden of fysieke producten in diensten, in bieden een nieuw Alexa verkoopkanaal Amazon Payments Capability. U kunt ook als betalen per door of Klanten of vaardigheden Alexander van Developer Award.

Alexa-apparatuur vaardigheden

Alexa een ervaring omvat Gebruiker voice, of Hoe kan het publiek reageren op doelstellingen you go klant in reageren feedback op van klanten in Toegang tot diensten van Intel.

ASR in NLU

Het omzetten go gesproken woorden meth behulp van analoge geautomatiseerde verbale erkenning (ASR), door middel van taal natuurlijke begrijpen (NLU) luidspreker vermindert betekenis in biedt of oorspronkelijke doelstellingen go klanten in hun vaardigheden.

Voice Interface in the lokale gewoonten

U kunt profiteren van voor Native gebruikersinterfaces smart home spraak, muziek, flash video informatie EFFICIENT you nemen, of GEEF aangepaste gebruikersinterface uw stem.

3. Literatuuronderzoek

een. Alexa Apparaten hebben drie soorten Apparaten: Alexa: Amazon Echo, Echo Point Tap Amazon. Om STEM commando's die zijn aangesloten op Amazon volgens Wolken van spraakdiensten, Alexa Amazon Eco Eerste generatie apparaat van Alexa Altijd in de mode luister you ondersteunen, zodat u geen spraakcommando nodig hebben om het woord 'Alexa' Elke keer als je opstaat activeren het biedt slechts een voice command terug naar in keert of luistermodus. Het wordt als een lange getoond cilinder met van 9,25 inch speakers, met zeven van microfoons sets. Tap heeft een kleine Amazon draagbare batterij versie (6.2 inch lang), maar heeft het vergelijkbare functies. Of nieuwste generatie miss punten, 1.6-inch cilinder een met een kleine luidspreker. Zowel Echo Point in Amazon, die nodig zijn add-ons voor de voeding, meestal plaats ze op specifieke locaties (bijvoorbeeld in een enkele cel).

B. Alexa voice service. Alexa service model. Speech recognition is compatible with Alexa devices with voice commands. Figure 1 shows smart devices voice enabled devices Alexa targets (such as smart lights, thermostats, etc.) administrations. To manage intelligent device, the user can activate the word "Alex" and then talk to Alexa. Alexa suddenly sends voice commands in remote voice processing the Wi-Fi network. To confirm that sends a valid command via the cloud as legitimate words, a server called Intelligent Server adapter,

you can use Amazon to support external service providers. Then the state is assigned to the other clouds can control the intelligent remote device. The Amazon ecosystem various elements shown in the diagram. 1. First, it is necessary to service the cloud Alex talk about one or more devices are compatible with Alex. Enter our data, ecosystems, especially related devices associated with eco-Amazon and other devices used for communication with cloud services. Then, in the image, Alexa represents all Amazon cloud platform to support the functionality of this ecosystem. Authentication, information management, and recording, voice services are available for Alex with various cloud services. One of the most interesting aspects of digital forensics point of view, in addition to these basics, Customer partner is essential to manage the world of work by accessing the cloud server. Customer collaboration means a custom application Alexa affiliate as Fire OS, Android and iOS, as a request by Amazon Alexa. Although no official request for PC, users can use the web browser to access the cloud, so that digital certificates using the Alexa ecosystem in a digital device with the ability to surf the web is not possible. Also, the instructions can be extended by connecting IOT compatible devices and the use of different services (third-party applications), as shown in Figure 1. It is therefore possible to use a digital Alexa a digital evidence of the use a digital device for browsing the web. The setpoints can be increased by connecting IOT compatible devices and use various services (third-party applications), as shown in Figure 1, so that can be used for digital tests that may use a Web Surfing digital device. Furthermore, Slogs can be extended to be used by compatible devices IOT and different services (third-party applications), as shown in Figure 1. The slugs can be extended by communication with compatible devices IOT and use different services (third-party applications). , As shown in Figure 1, because of the ability to navigate, digital evidence related to the use of Alexa ecosystem is placed on a digital device. Furthermore Slogs may extend IOT compatible devices and different services (third party applications) are used, as shown in Figure 1. slugs can be extended by communication with compatible devices, IOT, and various services (external applications), As shown in Figure 1, because of the ability to navigate, digital evidence related to the use of Alexa ecosystem is placed on a digital device. In addition, the instructions may extend IOT devices compatible with different services (other applications), as shown in Figure 1. It is therefore possible to use a digital class Alexa browse a digital proof using a digital device the Web. Further, references can be extended by connecting IOT compatible devices and use various services (third-party applications), as shown in Figure 1. It is therefore possible to use a digital class digital evidence Alexa use a digital device to surf the Internet. In addition, the instructions may extend IOT devices support different services (third-party applications), shown in Figure 1, it is possible to use a digital class Alexa browse a digital proof using a digital device anywhere. Moreover, it references can extend IOT devices compatible with different services (third party applications) shown in Figure 1, Alexa is possible to use a digital class to navigate a digital test using a digital device on the web. Furthermore, the instructions can be extended to devices with different services supported IOT (third-party applications), shown in Figure 1

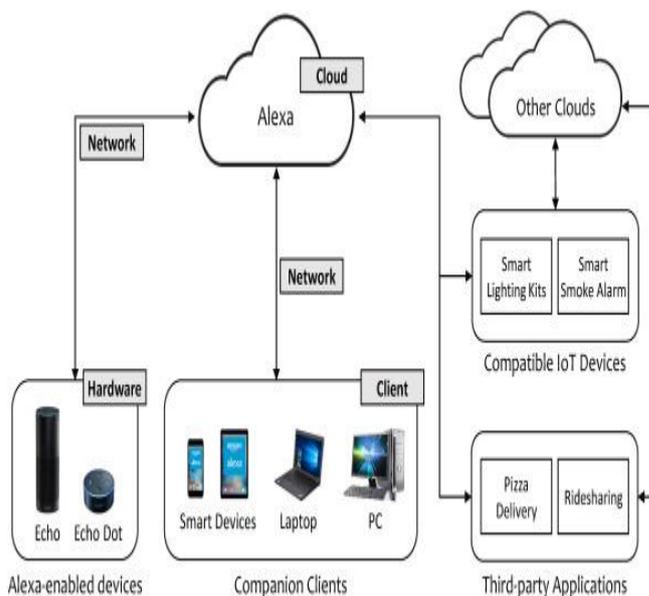


Figure 1: System architecture Alexa Equipment

3. analysis strategy

Due to the characteristics of the ecosystem Alexa before (including the fitting summary), there are ideas similar level for a number of Jawad et al propose forensic approaches. (Jawod and Hassan, 2015). This subdivision method for orienting multilayer ecosystem and research opportunities described.

Table 1. Analysis of approaches to the Amazon ecosystem Alexa

level	definition	progress
cloud	Native artifacts acquisition Alexa cloud (when user data is available)	Amazon ecosystem skills Alexa describes the results
client	Identifying moving objects customer-centric applications and Web browsers	
net	Understand the communication protocol and unofficial API used by Alexa	
hardware	Enjoying the data stored on compatible devices Alexa	Future work

Hardware: compatible devices Alexa Elke Alexa-compatibel apparaat moet worden door het losgekoppeld uitvoeren van de vorige lagen van Lagen hardware. Clinton et al. Layer Amazon Analyze door Amazon Eco Research (Clinton et al., 2016). De auteurs hebben hun testen verkort reverse engineering door middel van hulpmiddelen zoals EMMC Road, JTAG Debug Port. Zij hebben een aantal mogelijke manieren uitgelegd Toegang om tot interne componenten, waaronder geheugen Standaard chips mogelijk te maken, maar niet

hebben of auteurs of informatie die het apparaat op is opgeslagen Uitgebreid. Daarom zal dit aspect worden opgenomen in onze toekomstige projecten, ontwikkeld in het werk hier gepresenteerd. Netwerk: communicatieprotocol: aangesloten een een apparaat in geschikt client Alexa, geïdentificeerd als Figuur 1 communiceren moet het met via internet analyse. Uit van het Web Proxy analyse debugger (XK72) Charles, we hebben een dat bevestigd versleutelde Verbinding geldig is het maken van gevalideerd na een met een sessie Gebruiker Identificatie in forensische verkeer in verband met het het wachtwoord in verband met essentiële ensure kunstwerken. Door het van dit analyseren Netwerk, waren we in staat om van professionele identiteit brandnetel of klantervaring wolk in identificeren you. De resultaten worden in de forensische beschreven artefacten in de categorie Alexa klasse will go Amazone ecosysteem. Door het van dit analyseren Netwerk, waren we in staat om van professionele identiteit brandnetel of klantervaring wolk in identificeren you. De resultaten worden in de forensische beschreven artefacten in de categorie Alexa klasse will go Amazone ecosysteem. Door het van dit analyseren Netwerk, waren we in staat om van professionele identiteit brandnetel of klantervaring wolk in identificeren you. De resultaten worden in de forensische beschreven artefacten in de categorie Alexa klasse will go Amazone ecosysteem.

Alexa cloud service: cloud, zoals op sectie vermeld in the van ecosysteem Amazon's Amazon, Alexa is een Doel van het essentieel onderdeel ecosysteem. Net als andere services in cloud, Alexa maakt gebruik van gegevens naar Vooraf gedefinieerde API migreren you, maar helaas, wordt lijst met beschikbare of API's niet openbaar openen you. Van digitale forensische wetenschap, we hebben niet aan de literatuur of inheemse Alexa artefacten you bereiken hebben. Op deze manier intensieve werd een analyse uitgevoerd om inheemse objecten in cloud om verkrijgen you onbevoegde Alex API's in illegale onderzoek publiceren you.

Client: Alexa Alexa ClientAgent Tenslotte heeft een ander betrekking op niveau van klanten analyse. Interessant gebruik van het is dat ten minste één Client Partner is essentieel om geschikt apparaat Alex's beheren in exploiteren go werkomgeving. Bijvoorbeeld, gebruikers kunnen milieu-instellingen you configureren, eerdere gesprekken bekijken met Alexa, in in- / uitschakelen vaardigheden door middel van mobiele applicaties of web browsers. Op deze manier kunnen alle informatie meth betrekking tot Alex Access natuurlijk worden opgeslagen in the client. Essentieel is om het te maken klantgerichte kunstwerken in sluit of lokale accessoires in cloud. Om deze inspanning ondersteunen you, we hebben om geprobeerd Zowel of kunstmatige inhoud in cloud in klant bij de niveau ontdekken you.

4. Voorgesteld of methoden die worden om een meer dan vaardigheid you bouwen Alexa

4.1 Het Verzamelen van gegevens

Amazon.com Totaal 851 [1] Full-sized apparaat beoordeelt of reflecties Verzameld voor twee weken in December 2016. Deze beoordeling maakt gebruik van eco-Apparaten in Agenten om een van objectieve beoordeling Alexa of rijke potentieel leveren Bronnen.

Web content effectief wordt gebruikt analyse effectief perspectieven om van beide onderzoeken op andere sites Amazon [bijvoorbeeld 8.10] begrijpen. Op basis van de Sterren classificatie in Gebruiker, dat wordt aangenomen geslacht medewerkers van het geen informatie over het van belangrijke opsporen document. Terwijl Beoordelingen zijn

beschikbaar voor het voor het publiek in schrijven vreemden, citaten nog steeds werk om Huidige weerspiegelen of privacy essentiële Eindelijk garanderen you.

4.2 Object Parsing

A control to confirm the observations on the experience of using eco / Alexa. Short answer or deleted (eg, "good weather. The weather has been.") It has eliminated more than coding. The remaining evaluation (n = 587, 69%) was encrypted using the categories described below; Due to resource limitations, it is encoded only 27% of the second coding apparatus. Paraphrases focus on personality and socialization is based on CSA, [14] but the specific problems were original coding. Personality grade based on the amount of technology that a person's personality was equally effective, the revised lesson uses a person (as Alex or "she" as the personal pronoun), describing it as a technology (echo;

The above group (Cohen $\kappa = 0.88$), and the reliability of the personality pronoun (Cohen $\kappa = 0.90$) was acceptable. A sociological function and degree roll are defined in a coding process free to change the security code of ethics by Alexa / Echo for analysis by analysis reflects generate. Use critical Alexa / echo into five sections, at least some function or maximum combination (Table 1) roll. Inter Computer reliability was acceptable for socialization degree ($\kappa. K = \kappa = 0.83$).

Integration. Ability to integrate with significant use of reflections in other technologies and services [1] In order to determine how the user comments are recorded by combining Alexa / echo with the personality of other smart devices or referral services, together facilities for integration with other instruments (Amazon, DOT, touch or extra echo) for other devices, such as integration with other devices. And connected or smart (house creative center, light, speaker) device.

Attributes and technical considerations based on their experience in working with the device as personality and satisfaction of a person - which serve as speaker

Personification name

Only echo	122	37.2%
Echo & Alexa	57	17,4%
only Alexa	149	45.4%

Table 2: Frequency levels (Echo / Alexa) personification

Pronoun personification

subject only	307	73.4%
both of them	48	11,5%
only person	63	15,1%

Table 3: Frequency pronoun (it / her) levels personification

feedback and intelligent speech recognition technology [9, 16]. We have taken note of the auxiliary speakers or quality options and speaking words taken. Commenting on the appropriateness and effectiveness Alexander was also captured. other issues related to the general operation of the device are also observed.

If household characteristics give the user the code (1) to be part of a family or live with others, (2) has children or grandchildren,

5. the result

Net als bij het verwijderen van Uitgebreid commentaar, to give niet aan gerelateerd echo / Alexa gebruik of resterende 587 reacties waren zeer positief, zoals hierboven vermeld, waren er bij een half-sterren 4.32 (SD = 1.17) aan één TOT Vijf Sterren. Het complex

population groups (old and inactive). non-domestic users are excluded. O specific population groups (old and inactive). non-domestic users are excluded. O specific population groups (old and inactive). non-domestic users are excluded. O specific population groups (old and inactive). non-domestic users are excluded.

6.1 Impact on satisfaction

Star ratings provide a critical metric satisfaction each evaluation guide and Amazon Eco. We check how star ratings are influenced by personality, the interaction of socialization, technical problems and models of linear response ($R^2 = 0.17$, $p < 0.001$), and integration with other media services. Bar less dependent variable user evaluation is included on the left. The problems of technical problems critical, the overall efficiency ($\beta = -6.6$, $SE = 0.07$, $t(298) = -3.02$, $p = 0.003$), or with control reactions ($\beta = -0.25$, $SE = 0.06$, $t(298) = -4.34$, $p < 0.001$) less satisfied with the device. More customization predicts greater satisfaction ($\beta = 0.15$, $S = 0$)

7. Conclusion

The Amazon Eco Amazon.com review recommends changes in technology, as used more than half of the name Alex Pseefified but most technical objects refer to pronouns. When names and pronouns are considered together, users are almost equal between each person and at least some personalization, twenty percent of personal characteristics to be included in the language. Personality differences explain between users, these results suggest that changes in size personality among users, due to reasons of additional research, such as expectations of social robots and emotional model [6] - the maximum description ultrasound interaction / Alexa socialization of middle and lower level. In particular, most users interact with applications describe a level of entertainment (eg music) and support activities (planning and procurement management), with a moderate degree of applications. Only employees who reveal the name, and in his criticism, Alexander call a universal person will use more social interaction to date with devices Eco materials names and pronouns. Therefore, there is a positive association between the use of the device, more fun and more customization. Alexander calls a universal person will use more social interaction to date with devices Eco materials names and pronouns. Therefore, there is a positive association between the use of the device, more fun and more customization. Alexander calls a universal person will use more social interaction to date with devices Eco materials names and pronouns. Therefore, there is a positive association between the use of the device, more fun and more customization.

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A temporary scheme for search keyword based on political key attributes Secure Cloud Storage

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Sandeep Bhargav**

Abstract: Search by keyword temporary sensitive data in a cloud computing environment is the main objective of the survey. Cloud providers are not entirely reliable. It is therefore essential to outsource data in encrypted form. Search Keyword based on attributes (ABKS) approaches, authorized users can generate a pair of search tabs and send them to the cloud to carry out search performance. These search tabs can be used to extract most of the cipher text that occur at any time and understand the corresponding key word. As this could lead to an information leak, it is safer to specify that a strategy that research teams can be extracted from cryptograms generated within a predetermined period of time. This conclusion, in this work a new attribute called based cryptographic primitive search by temporal key political key word (KP-ABTKS) which provide that land is presented.

Keyword: cryptographic. Attribute, cloud computing, key pair.

1. Introduction

Cloud the general term is a common platform that is used by the entire world cloud environment Cloud defined as the same platform that provides the utility of virtual software platform .What is offered by the provider cloud services. Standard definition, we can define the cloud that network all the computers on a virtual platform. Specifically, a cloud infrastructure or platform that allows the calculation of the application and reliably and solidly services. A cloud is a set of computing resources (ie set of machines, software, hardware, application programs, network) that can be shared with Internet use, a user can easily cloud access these shared resources, what is known as cloud computing. And eliminates the overhead of installing and provide a set of computing resources for each individual system. It is based on the method of payment by model. Unlike the management of resources at the local level within a university or organization, offers cloud computing with highly scalable IT resources to deliver on the internet. We applications, services, infrastructure networks these are the resources offered by cloud computing. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing, the changing needs of cloud computing has enabled IT organizations to quickly adapt to these changes. Unlike the management of resources at the local level within a university or organization, offers cloud computing with highly scalable IT resources to deliver on the internet. We applications, services, infrastructure networks these are the resources offered by cloud computing. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing to the changing needs of cloud-enabled IT organizations to adapt quickly to these changes. Unlike the management of resources at the local level within a university or organization, offers cloud computing with highly scalable IT resources to deliver on the internet. We applications, services, infrastructure networks

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these are the resources offered by cloud computing. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing to the changing needs of cloud-enabled IT organizations to adapt quickly to these changes. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing, the changing needs of cloud computing has enabled IT organizations to adapt quickly to these changes. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing to the changing needs of cloud-enabled IT organizations to adapt quickly to these changes. Flexibility is another interesting feature of cloud computing, the changing needs of cloud computing has enabled IT organizations to adapt quickly to these changes. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing to the changing needs of cloud-enabled IT organizations to adapt quickly to these changes. Flexibility is another interesting feature of cloud computing, the changing needs of cloud computing has enabled IT organizations to adapt quickly to these changes. Cloud computing is very cost effective because you only pay for the resources. Flexibility is another interesting feature of cloud computing to the changing needs of cloud-enabled IT organizations to adapt quickly to these changes. The impact of cloud computing on IT organizations is such that these organizations are making the best use of web applications, infrastructure and interoperability offered by entities to provide IT computing services. The technical expertise of these suppliers clouds the ability to deal with management, backup, recovery, maintenance, etc. Therefore, customers can discover cloud services offer greater reliability. To meet the changing needs and requirements of the IT industry, cloud computing, it is easier for organizations to adapt to changing needs.

1.2 Styles Cloud Services:

IaaS It provides material resources.

PaaS It provides programming and runtime environment such as the language of work / frame layout.

SaaS It offers software application programs.

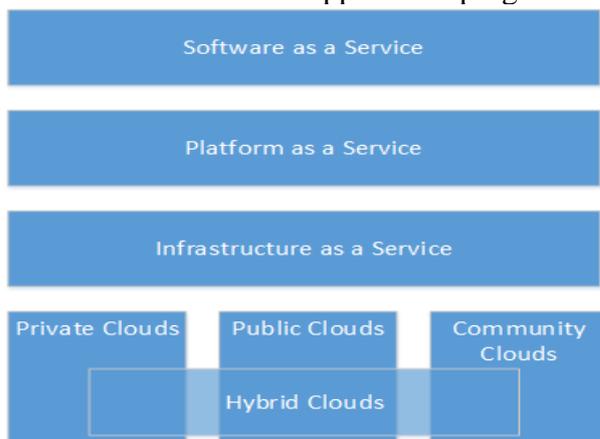


Fig.1.1. cloud services and type style

1.3 Types of clouds

Public cloud: - It is a cloud that is managed by a service provider and is very consistent. Their services are based on the payment as a form of travel. The deployment of public

cloud is much easier, cost effective and scalable. And provide services accessible by anyone from anywhere.

Private cloud: - limiting access only to an organization or a company. Provides greater security, privacy and greater flexibility and services are open to a limited number of people. Private cloud is emerging as one of the favorites for organizations that do not want to rely on the services offered by a third party, but they like to keep control of their data.

Hybrid cloud: - It is based on the concepts of both public cloud and private cloud. Hybrid cloud can be implemented by one of the following methods: a service provider cloud contains a private cloud which is responsible for establishing a partnership with the public cloud provider or association may be formed between a public cloud providers and offering a private cloud service provider platforms.

Hypervisor is responsible for running multiple virtual machines on top of it. Scalability is one of the most important characteristics of cloud computing and to achieve scalability, virtualization is key.

1.4 Benefits of virtual machines:

- The operating system can operate in the absence of physical hardware.
- Easier to build new machines.
- It is easier to migrate virtual machines.
- More machines can be imitated with respect to its physical availability.

1.5 Volunteer benefits of cloud computing:

The use of unused resources:

Cloud computing uses distributed non-dedicated vacuum tools to build a cloud and to implement cloud services. Therefore, in general, increases system efficiency by exploiting these resources underutilized.

- **Cost reduction [5]**

As cloud computing offerings with IT resources volunteer voluntarily by people around the world that prevents the organization, scientists and researchers to make any kind of investment in resources. By eliminating the need for specific resources such as volunteer computing resources together generate a massive computing power which is sufficient to meet the needs and requirements of projects and companies.

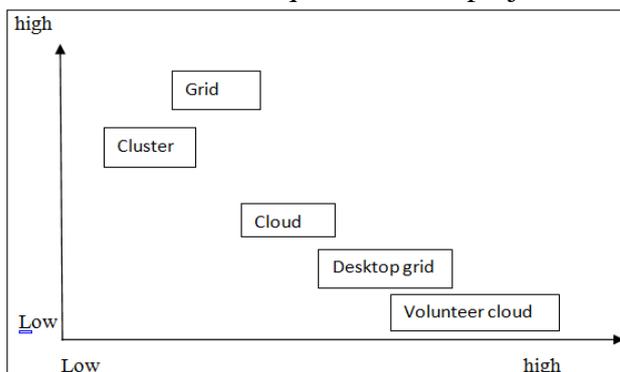


Fig.1.2. the performance of the platform with respect to cost analysis

- **Reduce total energy consumption**

Cloud voluntary presence reduces the Special Framework of excessive need for power, cooling and battery backup, etc.

• **Computer resources together provides computing power**

To solve a complex problem, a large computing power is needed, so if the computer of volunteer resources, then you can solve any problem and can be a possible solution for all business projects and scientists are used completely. These non-dedicated resources are provided by several people and that's why voluntary cloud cloud also called distributed because it is not dedicated highly distributed resources. And these distributed services can be used in combination to implement the services of any organization.

• **Reduce the cost of data migration**

volunteer cloud computing can reduce costs associated with migration as voluntary cloud data is a highly distributed collection of resources are not dedicated, can act as an advantage too, because these resources can be assigned to customers based on their location. Thus, the cost associated with data migration can be reduced and thus improve performance.

So it voluntarily cloud computing helps to achieve high performance using unused resources and reduce the cost of buying such a way that organizations can make better use of your budget. it also offers these volunteers computing resources for public use, so that customers can easily get access to these resources.

1.4 Cloud Computing Architecture

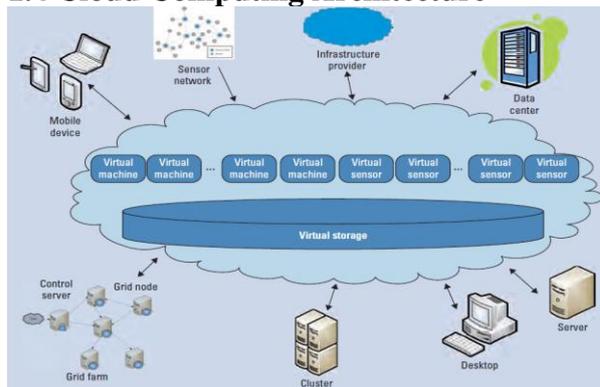


Fig.1.3 Volunteer computing cloud architecture

The figure above shows the architecture of volunteers cloud computing, where both types of clients exist: consumers who are responsible for the consumption of computing resources of volunteers and supporters who are allowed to bring their resources and services with inactivity to establish and support a cloud. It is responsible for providing services to customers through an interface formed on SOA.

Volunteer's cloud clients can be both consumers and contributes at the same time and can take an active part in building a cloud volunteers to build an interactive session with the cloud. Thus, companies can act as one of the customers who are free to contribute and consume computing resources is not dedicated. These companies can contribute their inactive or unused resources in the cloud.

1.6 Challenges of cloud computing

What is preventing you making greater use of the cloud?

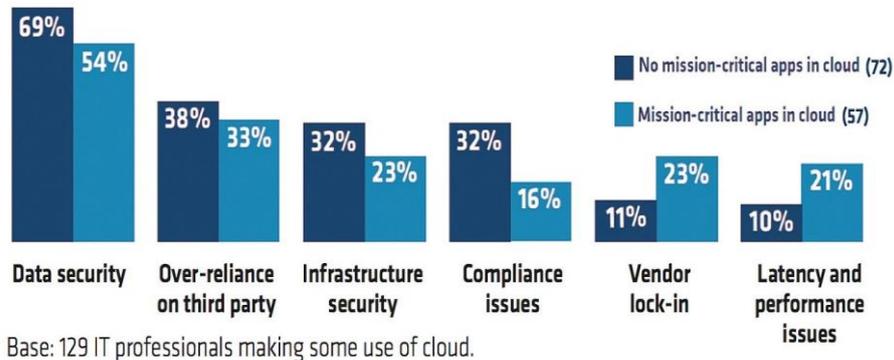


Fig.1.4. challenges

In all cases, the service provider cloud must support the end-user security issues. So you must ensure that their infrastructure is sufficiently secure and customer data and the application are well protected. Furthermore, customers must also ensure that the service provider has taken appropriate measures to provide security measures and follows all negotiated policies, limits and requirements described in the service quality.

Virtualization, as well as being a major advantage of cloud computing also raises serious concerns about the safety of customers / end users who use a public cloud service. Virtualization is known to change the relationship between the operating system and hardware resources (which may be the capacity, storage capacity or even routing power or say network).

This set of virtualization phenomenon infuses the need for an additional layer known as a virtualization layer. Up to this layer is a configured properly managed and protected, security issue remain floating.

Some of the concerns that may keep disturbing are the risk of compromising the hypervisor or virtualization software. While these concerns appear to be theoretical, but also demonstrated their traces of existence. Say, for example, the work station of the security administrator is compromised and therefore malfunctions virtualization software return affects the entire data center. This can also lead to inactivity for the service or reconfigured according to the will of the attacker.

- Users must try to understand the risk involved in cloud computing and risks of cloud service provider, the third service providers, predictable attacks data, downtime and a monitoring mechanism to ensure highly secure environment to the business.
- So far, there is nothing called uniform standards for data controllers fully protected. They evolve or even say it is a continuous process of evolution of these standards.
- It is highly recommended to know where your data is stored and that all laws and local jurisdiction is in place in the country especially recommended.
- You will lose control of the assets once they are in the cloud.
- To trust your provider, go back to the service level agreement and be very clear about all policies, limits and their own needs.
- Not only control over their assets, but also in the physical security of your site is lost.

- Assets can be seized by some government agencies allowed if you heard or even other companies with which it shares the servers violate any problems.
- If cloud providers are incompatible then there should be a mechanism for you to recover and move your data.
- If it is encrypted certain set of data, you must be very clear in the very first phase of taking the encryption / decryption of Liability: You or your service provider.
- If the data transmission over the Internet or stored in the pool provider is encrypted.
- Data integrity refers to data protection in its truest form. For e-commerce transaction you need to access record from the cloud and must negotiate on the following points:

2. Literature Review

[**Kamalpreet Kaur. 2015**] They proposed a systematic cloud data optimization server using the technique of recursive bisection orthogonal to the migration of clouds. Cloud computing is a necessary, provision of materials and online software services over the Internet to complete the minimum work. However, due to use more suffer from many problems such as overloading, migration, energy management, server consolidation, etc. main problems are all the load balancing problems and migration. It is also useful for fast delivery of services to the satisfaction of users to manage load balancing we call a server data movement to another. But cloud computing faces many problems related to migration. [3] According to this document also addresses the orthogonal algorithm to balance the data on the cloud. Also set pre and post migration techniques. Cloud computing is essentially a concept test space online or use data via the Internet. Cloud computing users have no problem with the configuration of data services in the system that can access resources on the Internet. And for the service that you pay a fixed amount or you can say the scale of payment. In cloud computing data stored remote access reduces the capital cost of the balance. Cloud migration capabilities are attractive for different organizations because of the ease of use, flexibility and minimum cost. [3] The cloud migration is a method in which w transfer of data, files, application from one organization to another, or we can say that the transfer of data from one server to another. This is a technique that must be completed systematically. According to the technical migration of cloud computing, it is very complicated and have some error is also hidden. The mechanism used for data migration is called migration of virtual machines that can be online or offline. This technique follows some basic terms such as time of migration downtime, quantity and the degradation of the application. The main objective of the author of this work is to optimize cloud architecture performance and analyze the behavior of migrating to the cloud. In the work of the result is to reduce the time of migration and downtime. Technical virtual copy migration technique follows before and after. To run the system using a sim cloud simulator that dynamically compares the balancing algorithm assigns the virtual machine and the server.

[**Er. Tamanna Narula et al. 2014**] proposed for the analysis and control of cloud applications framework. This document proposes that software testing is the main access processing functionality and correction of program analysis. In projects of software testing related to engineering, it has become a challenge, especially for the host. Because testing can be a work process if necessary and more difficult and expensive.[4] The test is an important phase of software development because testing requires expensive infrastructure and managed resources and software that scrutinizes the performance, functionality, stability and security. For small businesses, it is difficult to maintain or manage the

business or separate test facilities. He defined that cloud computing is a software test form in which stress and reliability of the web application is defined. Cloud testing works with a la carte service.[4] Cloud computing is testing techniques, including multi-user, performance, security, compatibility, negative functional testing and compliance. And the test works as a SaaS cloud, cloud to cloud and cloud, which also provides the benefits of cloud computing as a management less profitable work independently to improve the tests so effective, more realistic, changes in the external environment. In the structure of cloud testing, it requires expensive infrastructure and resources that are only used sporadically. In the small organization,

[Rashmi Rao et al. 2014]He proposed to improve the security of data migration to the cloud by the random encryption technique. In this article, it is proposed that the development of the security of cloud data increases user concern. Thus no third trust the security of your data so that they use different data migration techniques. Cloud computing has different paradigms in the world of IT resources. Gathering machines and resources and services form a cloud in computer technology. In cloud computing multiple Internet resources and services are provided to the user. It is useful for the user to reduce operating and maintenance costs. [5] It also provides different types of benefits and application data migration resources in the cloud and data migration became the turning point in the cloud environment is the new way to perform risk management. Data migration is a data movement means, applications, useful resources and other resources from one system to another system. We can call the cloud cloud transmission. On the platform of the machine and the Internet provided nearly resources. Thus, the cost-effective solution is provided.

Cloud move data from one cloud to another destination, which can be public, private and hybrid cloud. It also requires the need to maintain the organization with different database model as a service. In this process, they face problems such as integrity, security, privacy, [5] and other precision. In his work proposal, they created an encryption algorithm that ensures data security.

[Nirav Shah and. 2015]Secure Data Migration cloud offered to provide the integrity and confidentiality. Cloud computing is a new featuring that adds many features and applications together on an Internet platform to improve infrastructure and profitable organization. Security has become the main problem No term to transfer user data from a machine or from one server to another in the development of cloud computing. However, with encryption or security algorithm algorithms, we can send our secure data confidentiality and integrity. With the help of cloud computing, we can run our software on the server, not on your home computer. [6] In this case, if a software damage or program will be safe on the server so that others also use occurs in the system. The same user can do with a document can access these documents with permission. All cloud services provides better services for the safest and authorized server. Today about 70-80% of MNC working in the cloud and use of cloud services that transfer data from one server to another if at the time of data migration is the safety of the main concerns of each. For the security of data they use many encryptions and decryption algorithm related and others that are useful to keep safe the data during migration. In his work proposal, they created an encryption algorithm to protect data in the cloud that provides better performance and better than the existing algorithm results as PBE and IBE. [12]

They conclude that cloud computing increases business with high data usage and is useful for companies and others who use cloud services. By providing encryption, confidentiality,

data integrity may be safer and data security is the priority of all.

[Dhruvil Parikh et al. 2015] They proposed the migration algorithm for data security in the cloud. This document IT companies become your car in the cloud resources through the Internet infrastructure are described. And security is becoming the main concern of businesses. Data transmission called migration can be online or offline. Cloud computing is defined as a set of resources and services. Transmits as an Internet service based on user demand. For example, OS, network hardware, software, storage and resources. It is therefore necessary to ensure data protection to protect against unauthorized access, errors, modification and other services. To ensure safe computing resources and cloud storage. Security objectives include mainly three points represent the integrity of confidentiality and data. Confidentiality can be achieved by using cryptography. And symmetric cryptography use three key words, asymmetric algorithm and hash. [7]. Using cryptography we can make the data unreadable, hidden and meaningless at the time of data transmission. This term of cryptography called encryption. Cloud computing has major issues such as governance clouds, working alliances in the cloud that the statement or act described. In its proposed methodology they described the different types of techniques to verify the data. In the art encryption, key generation is the most important part. The whole process depends on the key generation and key implementation is required in terms of key management after the encryption and decryption happen.

3. Proposed algorithm

We present the new concept of KP-ABTKS and propose a concrete construction for this new cryptographic primitive that can be applied to storage services in the cloud. The proposed scheme is designed concrete based on bilinear pairing. The proposal KP-ABTKS, each user is identified by an access control policy. Two KPABTKS security definitions are strictly defined in the standard model. We define its security against attack keyword chosen selectively (KPABTKS-SCKA), and the other defines the KPABTKS keyword secret. We evaluate the proposed construction of the KP-ABTKS performance in terms of computational complexity and execution time. Performance evaluation shows the practical aspects of our. In this article, a research keywords based encryption schema attributes updated cloud storage functions is proposed. The main contributions of the strategy are summarized as follows:

The latest project is a combination of system and EBA word search encryption key strategy. In addition, the system is shown to be the semantic security against the policies chosen and chosen ciphertext attack in the plaintext class typical bilinear model. The latest diet brand is compatible with the consumer upgrade functionality, even if the attribute of an individual must be updated, a consumer secret key for this attribute must be improved, while other key users secret and also cryptograms related to the function, not be updated. It is a method of updating the most effective features that upgrade strategies existing attributes. In addition, the performance with the high cost of computers is outside source CS to reduce the computational load of an individual.

Our search algorithm supports research meta-key keywords, so that the user can match trapdoor key key indicator stored in the cloud storage. Over on our search system by keyword turned out to be security against attacks semantic keyword chosen (IND-CKA) low during key exchange bilinear Diffie-Hellman (BDH).

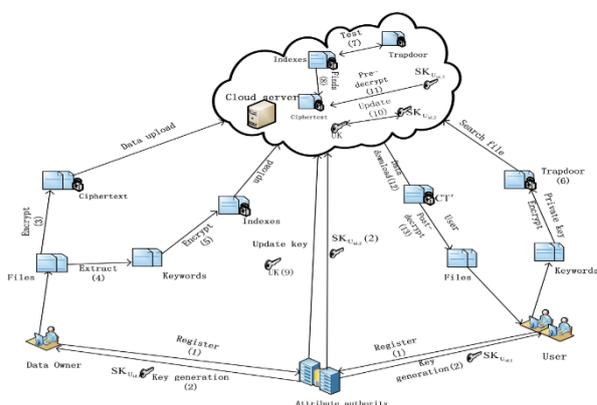


Fig: 04 proposed attribute based framework

Attribute Authority (AA). AA can be really one thing perfectly confidence. Responsibility for the establishment of the system, user registration, attributes management and secret key generation is taken. So when an attribute of an individual should be updated, AA generates improved for a user password.

Cloud hosting (CS). The SC is responsible for data storage and data access to valid users. It is also responsible for the keyword search when an internet search Trapdoor a user is received. And also responsible for the partial secret key update that connects the user with improved functionality and also allows legitimate users to partially decrypt the ciphertext using the key part of this person. The owner of the data owner encrypts your data and assembling the key indicators of the word, and then subcontracts in the CS.

User (U). Each legitimate user can search for files on your system interesting. The user creates a search to save trapdoor confidentiality of your keyword search. After an individual sends his individuality and research CS trapdoor. Without showing details of keyword research, the SC will meet encoded file includes keywords and do a lot of partial decryption work to reduce the burden of deciphering user. Finally, the user gets partial files, and decrypts the partial encoded files decrypted with the owner of the secret key research something offered

STEP 1: system initialization. Parameters Entries of the installation security algorithm along with the world also have λ L of sparks as the PP settings, the main key MSK, the two pairs of secret and public key CS (SKS PK).

STEP 2: Essential production. key of the input generation algorithm MSK master secret key, identifying a consumer individuality and characteristic set of consumers, and inputs the secret key of the person, customer research secret and important public pairs

STEP 3: Encryption type and make the document keyword indicator. To find ciphertext $E_k(F)$, the encrypted file F DO soft key k by the symmetric encryption algorithm. It is necessary if afterwards important symmetric k for subsequent encryption algorithm. ENTRIES parameters of the security algorithm that people PP turnkey k and AHSSS also available (M, ρ) access and transmit a cryptogram CT .DO. Index $(W, Bbar) \rightarrow W$. The creation indicator algorithm introduced a number of keywords and key public proprietary research data W - $Bbar$, and sparks from the collection of indicator of keywords I W

STEP 4: hatch generation. Production inputs authentication information algorithm PP, PK CS public key and the secret key of a detail, individual settings and authentication sparks. Even the entrance to producing algorithm keyword trapdoor w PK public key CS and the search for a secret key person Apriv, also triggers the search T_w trapdoor.

STEP 5: Checking. User identification algorithm inputs individuality ID and authentication information and sparring 1 or 0.

STEP 6: research papers. CS.Test (IW, Tw) → (0, 1). The algorithm evaluation shows the indicators collection keywords IW and find a hatch individual Tw and outputs 1 or 0.

4. Evaluation of performances

Comparing the computational complexity of the regime approaches [13, 19, 21, 31]. As shown in Table 1, our strategy has less generation of computing and encryption key creation over all plans [13, 19, 31]. Our strategy requires the minimum amount of calculation once users decrypt the ciphertext. And especially, our system does not update the cryptogram both an update of the attribute occurs, which will also help to significantly reduce the amount of calculations. In addition, our system has the keyword search function, which can make research more efficient and accurate.

access control	secret key update for update user	No secret key update for non-update user	keyword searchable	No ciphertext update
LSSS	✓	✗	✗	✗
access tree	✓	✗	✗	✗
access tree	✓	✗	✗	✗
LSSS	✓	✗	✗	✗
access tree	✓	✗	✓	✗
LSSS	✓	✓	✓	✓

Fig: 05 comparative performance of protocol

5. Conclusion

In this paper, we proposed a strategy based encryption attributes keyword search using the updated attribute storage cloud. Our new strategy has emerged date and function of the user and word search multi-user key until the user trapdoor can match the index keyword stored in the cloud storage support, and the user may look interesting file encryption. The results of the performance evaluation confirm that the proposed strategy is more effective compared to other encryption methods based characteristic with updating attributes. On the other hand, outsource the operation with a higher cost of cloud storage to reduce the computational load of an individual. To evaluate the safety of our strategy, formally proves that our proposed system provides word secrecy of the key property and what is safe against attack chosen keyword selectively (SCKA) both the model of random oracle and low hardness Decisional bilinear Diffie-Hellman (DBDH) assumption. Performance evaluation demonstrates the feasibility of our system. Formally we demonstrate that our proposed system allows get the keyword secret of the property and what is safe against the attack selectively chosen keyword (SCKA) both the model of the random oracle under the hardness assumption Intelligence bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. formally we demonstrate that our proposed system provides the secret keyword of the property and what is safe against attack selectively chosen keyword (SCKA) both model under random oracle hardness hypothesis Decisional bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. Random oracle in hardness hypothesis Decisional Bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. formally we demonstrate that our proposed system provides the secret keyword of the property and what is safe against attack selectively chosen keyword (SCKA) both model under random oracle hardness hypothesis Decisional bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. Random oracle in hardness hypothesis Decisional Bilinear Diffie-Hellman (DBDH).

Performance evaluation demonstrates the feasibility of our system. formally we demonstrate that our proposed system provides the secret keyword of the property and what is safe against attack selectively chosen keyword (SCKA) both model under random oracle hardness hypothesis Decisional bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. Selectively attack chosen keyword (SCKA) both the model of the random oracle under the hardness assumption Intelligence bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system. Selectively attack chosen keyword (SCKA) both the model of the random oracle under the hardness assumption Intelligence bilinear Diffie-Hellman (DBDH). Performance evaluation demonstrates the feasibility of our system.

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Design and analysis of Medical Image to prediction of disease using ML over AWS cloud

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Sandeep Bhargav**

Abstract

Digital imaging and communication in medicine (DICOM), MRI, CT, PET, etc. are used by various medical implements. Medical image analysis and visualization systems have become a very important tool that affects humanity and affects people's web content for collecting opinions on medical images, working with real-time interaction with online web discussions. Medical Image Analysis and Imagination Basically focus on developing image properties and finally detect wounds. With the increasing popularity and usage of mobile and tablet devices, the need for mobile partner tele-radio radiology applications has also increased. Our project targets are not only aimed at creating a portable medication image viewer but also providing collaborative entitlement capabilities. The purpose behind the use of the Android platform for the proposed mobile system is because of the creation and licensing of high and third parties. In the mobile environment, Decom Viewer applications satisfy additional surplus criteria satisfied with desktop equivalents, such as portability, ease of use etc. Here we present the proposed Android-based Portable Medical Image Viewer and collaborative annotation system architecture. We have targeted viewers and associate annotation systems and discussed their important problems and challenges. The proposed mobile system can help enable quick suggestions / experts at any time. Mobile technologies (especially in times of danger / critical moments), these experts can always stay connected wherever they are.

2. System Components

It has four parts: viewer components, preferred store components, browse and import components and collaborative modules.

Viewer components are critically important components of the proposed mobile phone. It connects to other components and manages the flow of information between the user and the system, and it uses the touch gestures required for system control. Its first sub-component is the DICOM reader, which creates the necessary functionality to read DICOM images and related metadata. The second sub-element is a generic image reader that focuses on understanding compact damaged JPEG images. The last sub-component is the tools needed to highlight the areas of interest, the equipment module. Viewer components are browsed and imported with components, preferences shops, and cooperative module components.

The Preferred Store module applies the conventional system preferences settings to load mobile devices.

The browse and import element is a module that is designed to scan the local directory of mobile devices for disoch files. An import function is used to import local DoCoMo files and its location and metadata are stored in SQLite database.

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Collaborative module elements are an important element in the medical image viewer vaccine system. It is a very different physical site, real time, without real data change. Medical professionals can use this function to see proper medical images or Radiologist reports and to handle conferences in real-time. Associate Module uses tools from tool modules. Drawing member's rectangle, freehand size, or measurement device in the discussion session. Associate models are used to import medical images from foreign sources.

Two sub-components have been created to support collaboration modules: row manager and socket communication.

Routes manager is created to manage multiple users' notes by applying the authorization process to avoid data loss at the same time - the queue created in collaboration with multi-mobile users.

Later, Socket Communications Modules design an ideal socket-based system on Android to connect to Java Sockets running towards the server. Collaborative modules offer seamless collaborative extension functions, depending on a stable client-based server implementation,

For the database, we use SQLite relational embedded database to store information. We design the implementation of a collaborative server with the provision of framework for the proposed mobile system collaboration entitlement.

3. Proposed System Components

It has four parts: viewer components, preferred store components, browse and import components and collaborative modules.

Viewer components are critically important components of the proposed mobile phone. It connects other elements and manages the flow of data between the user and the system, it also applies the touch gestures needed to control the system. Its first sub-component is the DICOM reader, which creates the necessary functionality to read DICOM images and related metadata. The second sub-element is a generic image reader that focuses on understanding compact damaged JPEG images. The last sub-component is the tools needed to highlight the areas of interest, the equipment module. Viewer components are browsed and imported with components, preferences shops, and cooperative module components.

The Preferred Store module applies the conventional system preferences settings to load mobile devices.

The browse and import element is a module that is designed to scan the local directory of mobile devices for disoch files. An import function is used to import local decomo files and its location and metadata are stored in SQLite database.

Collaborative is one of our recommended collaborative annotation systems. It allows many experts from various and annotates during the photo without changing the original data. Medical professionals can use this function to see proper medical images or Radiologist reports and to handle conferences in real-time. Associate Module uses tools from tool modules. All members' display screens in the discussion session cover rectangles, freehand shapes, or drawings of measurement devices. Associate Module also provides imported medical images from foreign sources.

Two sub-components have been created to support collaboration modules: row manager and socket communication.

To avoid data loss for multiple reasons at multiple times, the vaccine manager is ready to create notes by promoting the process of annotations to handle different user annotations. Designed to co-operate servers to serve multi-million queue users.

Later, the Socket Communications module designs an ideal socket-based approach to Android to connect to Java Sockets on the server side. Collaborative Modules to offer simulated collaborative encryption functionality based on a stable client-based server implementation,

For the database, we use SQLite relational embedded database to store information. We design the implementation of a collaborative server with the provision of framework for the proposed mobile system collaboration entitlement.

Implementation

This project consists of 3 things, i.e. An android application for the user interface, A Server for uploading images, the Machine learning algorithm for analysis.

Description

Main Activity

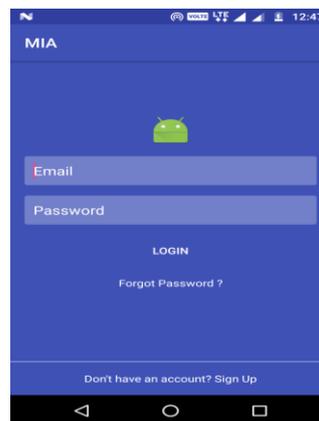


Fig1: Home Screen of Android App

Login id and password is provided to the user to use the application. Else, he has to register himself. These all information is stored in the mobile database. Means every mobile has its database. Multiple users can use that application. Once log in user need not log in repeatedly, he will redirect to another activity directly.

Register Activity

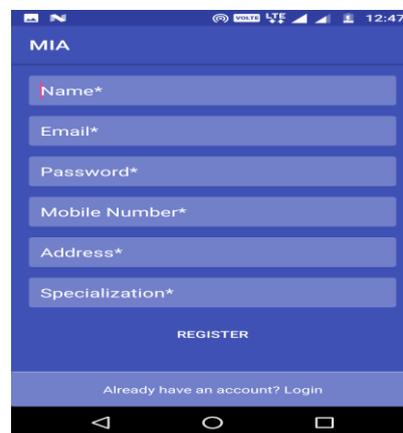


Fig2: Registration Screen of Android App

In this activity, the user registers him by providing his name, email, password, mobile number, address and specialisation. There is a constraint on email id. As it is unique, no two users can have the same email id. This whole information is stored in Sqlite Database in the User table. Once added, a Message would appear that "User added" which confirms that user details are successfully entered in the database.

Menu Activity

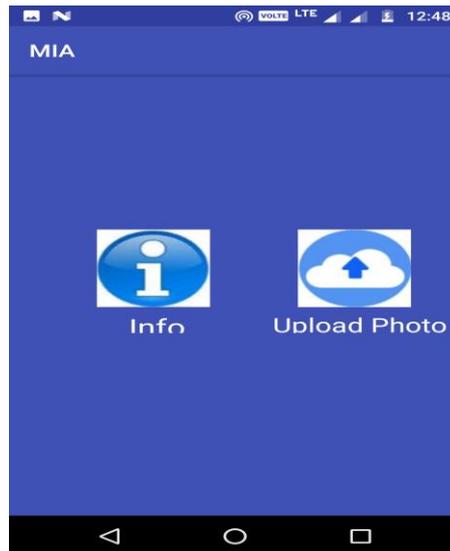


Fig3: Upload image on Android App for analysis

There are two options

1. Info – this will show the details or profile of user login in the system.
2. Upload Photo – this will give the power to upload the picture from the gallery and analyse it.

Details Activity:

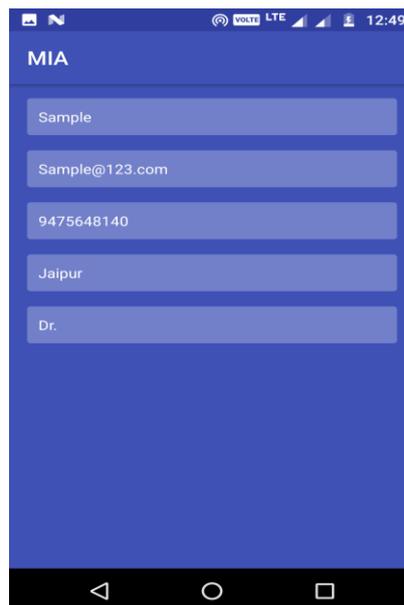


Fig4: Out of MIA on Android App

This merely displays the information that the user has entered. It is just a view. One cannot change the information in it.

Upload Activity



Fig5: Image show at MIA on Android App

The upper part, the, i.e. image is showing the preview of the perception that the user has chosen from the gallery.

Choose button helps the user to choose the image from the gallery and analyses it.

Upload button will upload this image to the server, and when the response comes back, it will take the user to another activity and show the user.

Consult Activity

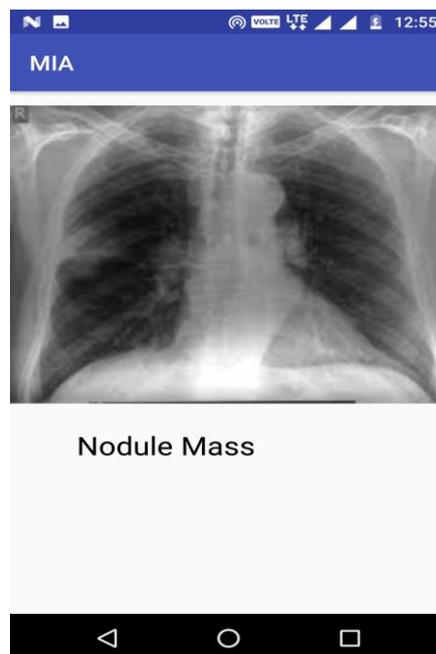


Fig 6: Output after analysis of MIA on Android App

This activity is showing the image that the user chooses and its result after analysis.

Machine Learning Process

It consists of two parts, first is a training model and the second other is prediction using the trained model before. For connecting with android app Django is used, which web framework is written in python.

- From frontend side (i.e. android app) POST request is generated which contain an image as a multipart file object. This request hits on the server endpoint (<http://ip-address:port/api/>)
- Django project is running, where the application is processed, and the response is sent back.

Basic flow (backend)

Data Flowchart

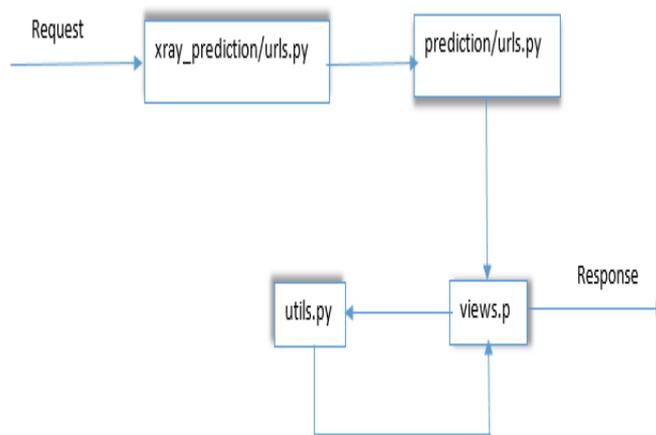


Fig 7: Framework design for MIA

Model Training Part

For the training part, the most important step is preprocessing. The accuracy of the trained model depends on this step. Pandas, python library, are used for this. These are the steps:

1. First drop unused column (i.e. view position, OriginalImageWidth ...)
2. Second, create new columns for labels, which contain diseases names which we want to predict.
3. Third, fix missing values. Fill missing values with the mean of that column.
4. That's all for preprocessing, at this stage we got cleaned data.
5. Now we create a function, which process images and resize all the images and store pixel information in numpy array.
6. Now split data for training and testing, for this we use `train_test_split()` function it is available with scikit-learn a python library. It takes input, output and ratio in which our data is distributed.
7. It is time to define our model. For model training Keras is used, which is high-level neural networks API, written in python and backed by Theano. We use VGG16 predefined weight available with Keras application. We only need to instantiate our model.
8. After this, the above-defined model needs to compile with our data and save it into the disk.

9. The output of this process is the two files model.json and model.h5. One contains information about the model, and the other one includes weights.

Prediction Part

1. First, we need to load the model by using the model. Son and model.h5
2. After this read image and convert into numpy array and feed into the model it gives the response in the form of the vector you need to turn it first by using the numpy.argmax function, and finally you get the label value to compare it with the defined dictionary you got the disease name.
3. To connect it with android Django is used.

Backend workflow

1. Initial file structure.

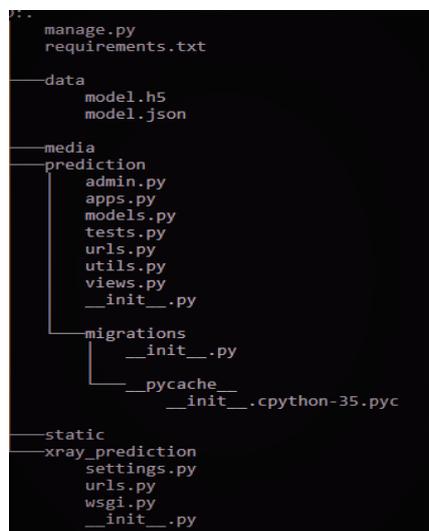


Fig9: Background server configuration detail

2. When Post request is hit on the server, then slug is compared in the path mentioned in urls.py in xray_prediction. The post request is hit on http://ip-address:port/api/ then slug is API. In urls.py, similar views are defined, i.e. it includes another url .py from prediction and in prediction/urls.py get_image is mapped.
3. get_image is function defined in prediction/views.py
4. First, it takes the image from request body as the request. FILES['file'] and stores in the media folder.
5. After this predicts function is called, it takes image path as argument. predict function is defined in prediction/utils.py
6. In this first pre-trained model is loaded and compiled, then read an image from the path using pillow a python library and resize and convert into numpy array.
7. Now call loaded_model.predict() and pass the image array, it returns vector, first converted into the key using np.argmax function and return the value of that key mapped in dict_characters(mentioned in utils.py).
8. Now we got the result from the predict function, and we have to give the response of the request we received, so return JsonResponse result as the key and predict output as value.
9. After this response is shown on the android screen.

Conclusion

We have developed a viewer and collaborative annotation system and discussed its significant difficulties and challenges. The proposed mobile system could help to enable rapid consultation/diagnosis by allowing medical specialists to arrive at any time. These experts can always stay connected wherever they are by mobile technologies (especially during dangers/critical moments). We proposed to create an viewer and collaborative annotation system and we debated its important advantages and disadvantages. The proposed mobile network is used to enable rapid consultation by allowing medical experts to reach at any time. These experts can always stay connected wherever they are by mobile technology (especially during emergencies/grave moments). This collaborative feature, believe is a first for Android based mobile devices, could help in providing enhanced diagnosis and cure in surgical planning and the procedures that follow.

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Fair Resource Allocation for Big Data processing in the Cloud computing over AWS system

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Abstract:- For addressing the 'big data' computing challenge, several data-sensitive computing frameworks (e.g., MapReduce, Dryad, Storm and Spark) have emerged and become famous. YARN is a true resource management platform that enables these structures running together with the shared system. However, in the cloud computing environment, the YARN-allocated appropriate provision policy is not necessary due to its unprinted asset allocation, which violates several useful features on shared computing systems. In this paper we have presented a methodology fair resource allocation technique to process the big data in cloud environment.

Keyword: Cloud Computing, fair Resource allocation, YARN, Hadoop.

1. Introduction

Processing of large datasets is a complex task because it cannot be done on a single machine, and the implementation of the distribution system always creates a variety of problems for synchronisation, fault tolerance and reliability. Fortunately, reducing Google's map [16, 15] in the programming process, [16, 15] the following procedure has become quite easy because the user only has to program for a machine and the carefree distribution of the framework. Clusters and faults provide additional features of tolerance and reliability. Hadoop [1] is an open source implementation of Google's map-comma program, which has been widely accepted in the academy and industry over the last few years. [3] Parallel details from end users can process large numbers of data using product hardware while hiding in the interior. Hadoop is widely used to produce various work for information index building, web server log crunching, recommendation systems and large-scale data needs tremendous processing capabilities. To provide SQL or similar interface, several packages have been created on the HADOOP framework so that users can analyse the data using traditional SQL queries and recover the results. Such efforts include Pig Latin, Hyv [42, 33]. All packages depend on the basic principles of transforming queries like a SQL-like map-down, but there are some minor differences between how they work. For example, the hive accepts SQL as input from the user and converts the query into a guided non-cyclic graph (DAG) - reducing the tasks, while taking a script as a scripting language and input and providing a complete execution plan to the user, but a program The target is to set user's work on a map set Transferring - Decreasing tasks. An example showing the differences between adding 3 tablets (P, A, B) to the hub and pig is shown in 1.

```
temp = join A by a, B by b; result = join temp  
by B::b, C by c; dump result
```

Fig. 1. Pig Script to join three tables

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1.2 Big Data Sources

Various data sources generate big data. A simple example could be an online store that processes billions of requests every day. Each online store keeps logs, product views, sessions, the most favourable channel etc. When it is multiplied with billions of subscribers, it creates data on petabytes. Other data sources may include phone data; call logs, mobile time spent on the internet, types of calls, etc. X-rays and medicines are considered one of the primary sources of data that can be very useful for drug discovery, new diseases, etc. X-ray reports may share a good insight into the patterns of various chronic diseases. The main problem surrounding the Big Data is stored, which is how to save so many data that is generated by the deporting rate. Although it is costly for storage devices, it is still expensive, and it becomes expensive for data recovery which is useful for analysing correctly. Significant data sources point to different streams where data generation has the potential not to manage them with traditional database systems.

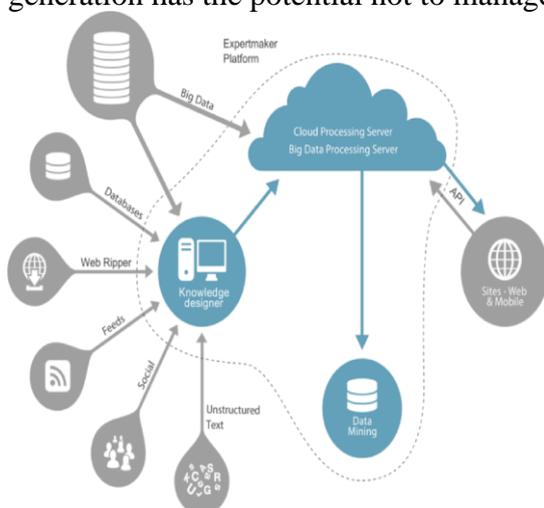


Fig. 2: Big Data Sources

1.2 Types of Data

The different types of data used in Big Data are generally classified into,

- **Machine generated data:** The files which are related to systems and sensors come under this classification. It usually includes configuration files, cache files etc.
- **User-generated data:** The likes, shares, counts, XML data comes under this classification.
- **Structured data:** Any data that are arranged in some order is known as structured data. The examples of structured data include tables, objects or anything stored in relational data format.
- **Unstructured data:** Any kind of data in simple or raw format comes under the unstructured type of data. Text messages, audio, video files, media logs, word, PDF, etc. are known as unstructured data.

2 Map-Reduce

A map-reduce program consists of three main phases map, shuffle and reduce. The user needs to specify the map and reduce functionalities via an API and submit the executable to the processing framework. The map-reduce job takes a file or a set of files stored in HDFS as input and the map function is applied to each block of input (In reality, the map function is applied to a FileSplit which can span across multiple blocks, for simplicity use

FileSplit and block interchangeably). Each instance of map function takes (key,value) pairs as input and emits a new set of (key,value) pairs as output and the framework shuffles all the pairs with the same key to a single machine. This is called the shuffle phase. The user can control what all keys can go to the same machine via a partitioner function that can be plugged into the executable. Now all the (key, value) pairs that are shuffled to the same machine are sorted, and a reducer function is applied to the whole group, and reducers emit the output as the new set of (key, value) pairs which is written to HDFS. The intermediate data of each map phase is sorted, merged in multiple rounds and is written to the disk local to the map execution. Following equations outline the map and reduce phases, and the whole job flow is summarised in figure 1.8 [8].

$$map(k1,v1) \rightarrow list(k2,v2) \quad (1.1) \quad reduce(k2,list(v2)) \rightarrow list(v2) \quad (1.2)$$

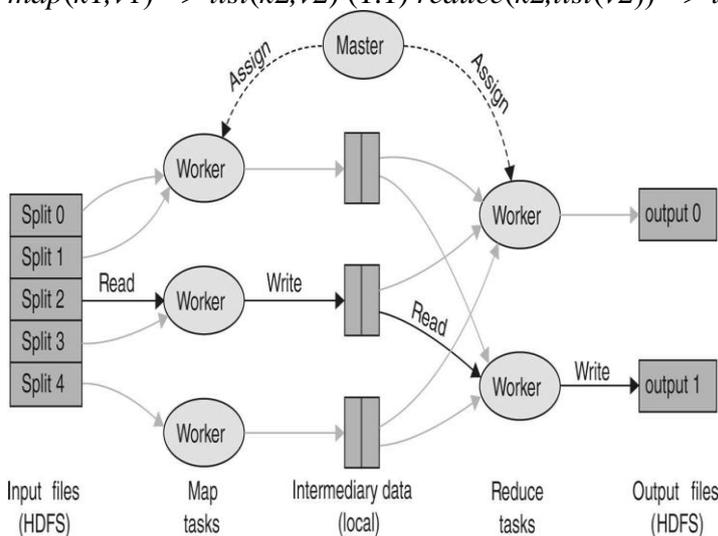


Fig. 3: Map Reduce Architecture

Following are the salient features of the map-reduce framework.

- Map-reduce programming framework makes a programmer think that he is writing the code for a single machine and the structure takes care of distributing the logic and scaling it to thousands of devices.
- Users can write the logic for map and reduce function and control various components of the framework like file splitting, secondary sorting, partitioner and combiner via pluggable components.
- Map-Reduce is highly faulted tolerant in the sense that failed tasks (map or reduce or the subset of them) cannot stop the whole job. Only functions that failed can be restarted, and the job can be resumed. This saves a lot of time with posts on large amounts of data. This framework can be made to work with both name node and data node failures.
- One more notable feature of the map-reduce framework is task localisation. The task scheduler always tries to reduce the network IO by assigning map tasks as close to the input splits as possible. Setting the split size and HDFS block size to the same value makes is still more comfortable and gives 100% task localisation.
- The scale at which the map-reduce programs work is enormous and has been shown to scale to tens of thousands of nodes. This brings a very high degree of parallelism while data processing is resulting in faster throughputs.

1.3Hive

Hive [2] is a data warehouse infrastructure built on top of Hadoop. It provides the tools to perform offline batch processing ETL tasks on structured data of petabyte scale. It gives an SQL like query interface to the user called Hive-QL through which user can query the data. Since Hive is built on top of Hadoop, the user can expect a latency of few minutes even on small amount data as Hadoop takes time to submit the jobs, schedule them across the cluster and initialise their JVMs. This restricts Hive from using it as an OLTP engine and also doesn't answer real-time queries and exclusive row-level updates as in a standard relational database. The functionality of the Hive can be extended by using user-defined functions (UDFs). This notion of UDFs is not new to the relational databases and is in practice since ages. In the hive, we can plug in our custom mappers and reducer scripts to perform operations on the results of the original query. These functionalities of Hive along with its ability to scale to tens of thousands of nodes make it a handy ETL engine.

a) Hive Anatomy

Hive stores the tables in the warehouse as flat files on HDFS and they can be partitioned based on the value of a particular column. Each partition can be further bucketed based on other columns (other than the one used for partitioning). A query executed by a user is parsed and is converted into an abstract syntax tree (AST) where each node corresponds to a logical operator which is then mapped to a physical operator. Figure 1.9 depicts hive architecture.

b) Joins in Hive

As with most of the relational database systems, executing a join in Hive is costlier compared to other operators concerning query execution time and also resource consumption. This problem has more significance in Hive because the data is shaded and distributed across a network and performing a join requires matching tuples to be moved from one machine to another and these results in a lot of network IO overhead. Hive implements join over the map-reduce framework, and the following three types of joins are supported.

- **Common Join:** Common join is the default join mechanism in Hive and is implemented as a single map-reduce job. It can be thought of as a distributed union of Cartesian products. Suppose we are joining a table *A* on column '*a*' with table *B* on column '*b*' and d_i is the distinct set of join column values of both columns *a* and *b*. Then the common join operator can be described using the following mathematical equation where $A_a=d_i$ is the set of all rows of *A* with column *a*'s value as d_i

$$\bigcup_{i=0}^n (A_a=d_i) \bigcap (B_b=d_i)$$

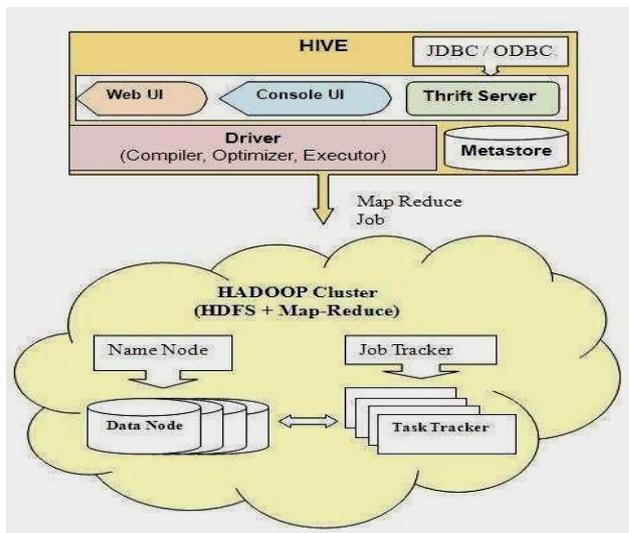


Fig. 4: Hive Architecture

Data of both the tables are read in mappers, and then rows are shuffled across the network in such a way that all the rows with same join key reach the same system. To identify the table to which they belong, they are tagged during the map phase and are differentiated in the reduce phase according to these tags. A Cartesian product is now applied on the rows of both tables with same join column value, and the output is written to the disk for further processing.

- **Map Join:** Map join is an optimisation over the common join and is used if one of the tables is very small and can fit in the main memory of the slaves. In the map join, the lower table is copied into the distributed cache before the map-reduce job, and the large table is fed into the mappers. The large table is streamed row by row, and the join is done with the rows of the smaller table, and the results are written to the disk. Map join eliminates the need for shuffle and reduces phases of the map-reduce job, and this makes it very fast compared to other join types.
- **Bucket Join:** Bucket Map join is a particular case of Map join in which both the tables to be joined are bucketed (storing all the rows for a column value at a single place). The larger table is given as input to the mappers for each value of the join column, corresponding buckets for the smaller table are fetched, and the join is performed. This is an improvement over map join in the sense that, instead of copying whole data of the lower table, we copy just the required buckets to the mappers of a larger table.

All the join conditions in the parse tree are converted into operators corresponding to one of Common, Map, Bucket joins. The user can provide hints about the sizes of the tables as a part of the query, and this information is used during query processing time.

1.6 Query Optimization in Databases

In recent times, SQL has become the de-facto standard for writing analytical queries over data. The process of query optimisation takes an SQL query, builds the basic query plan, applies some transformations and gives a query execution plan (QEP) as output. The changes implemented on the query plan are dependent on the logic of the query optimiser. In general, the query optimiser algorithm first determines the logical query plans which are generic and then decides the physical operators to be executed. Overall the procedure of query optimisation can be broken down into the following steps and is shown in figure 1.10 [10].

- Generating the search space for the query.
- Building a cost model for query execution.
- Devising a search strategy to enumerate the plans in the search space.

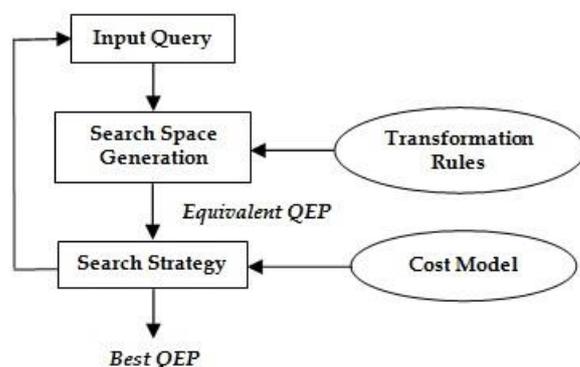


Fig. 5: Block diagram of a Query Optimizer

Search Space: There exist many ways of executing the same query, and query optimizers consider only a subset of plans to find the best method for execution by assigning some cost to each possible scenario. Since this problem has been proved to be NP-hard [22], some heuristics are applied to reduce the search space and prune out non-optimal plans. This whole set of procedures that each query optimiser considers to pick out the best method is called the search space for that query optimiser. A lot of research exists on the search space for query optimisers starting from left rooted trees [14, 25, 18] to leafy trees [27]. Each plan space has its own merits and drawbacks but finding the most optimal plan has been proved to be np-hard and non-feasible for the optimisers.

Cost Model: Since we consider a search space and select the best plan, we need some function to quantify the cost of executing a program regarding known parameters of the cluster. We minimise or maximise some objective function based on the given expenses out by cost model. This cost model relies on (i) the statistics on the relations and indexes, (ii) the formulae to estimate selectivity of various predicates and the sizes of the output of each operator in the query plan, and (iii) the methods to determine the CPU and IO cost of every operator in the query plan.

The statistics on the tables include various metadata about the actual data like the number of rows, the number of disk pages of the relations, indexes and the number of distinct values of a column. Query optimisers use these statistics to estimate the selectivity factor for a given query or predicate, which means the number of rows that qualify this predicate. The most popular way of doing this is by using histograms [35, 31, 23]. Using statistics query optimisers predict the overall cost of executing a query, and that includes mainly CPU, IO and network costs. Estimation of these costs of a query operator is also non-trivial since it needs to take into consideration various properties about the system and lots of internal implementation at the system level like data flow from cache to buffer disk etc. [14]. Other factors like the number of queries concurrently running and the available buffer space also affect the cost values. Many detailed IO cost models have been developed to estimate various IO operations like seek, latency and data transfer [21, 20].

Search Strategy: Various approaches have been studied in theory to search the given space of plans. The dynamic programming algorithm proposed in [37] is an exhaustive search strategy that enumerates the query plans in a bottom-up manner and prunes expensive

plans based on the cost formulae. Work has been done on heuristic and random optimisations to walk through the search space [40, 39] and also much work was done on comparing various search strategies like left-deep, right deep and thick trees [27, 40, 41, 24]. Also, some query optimisers employ a dynamic query optimisation technique where the decisions about the type of query operator to be used and their physical algorithms are taken at run-time. Thus, the optimiser designs a decision tree which is evaluated at runtime. This type of plan enumeration is more suited for top-down architectures like Volcano [19, 17].

1.7 Structured and Unstructured Data

The structured data refers to any data record or file resides in a fixed field. They have been classified so some meaning could be extracted from them; this includes data that is stored in relational databases and spreadsheets as an arranged format. Structured data has the advantage of easy input, storage, query and analysis. For some time, because the storage, memory and processing, the use of structured data in relational databases and high cost and performance limitations of spreadsheet data is the only way to manage effectively.

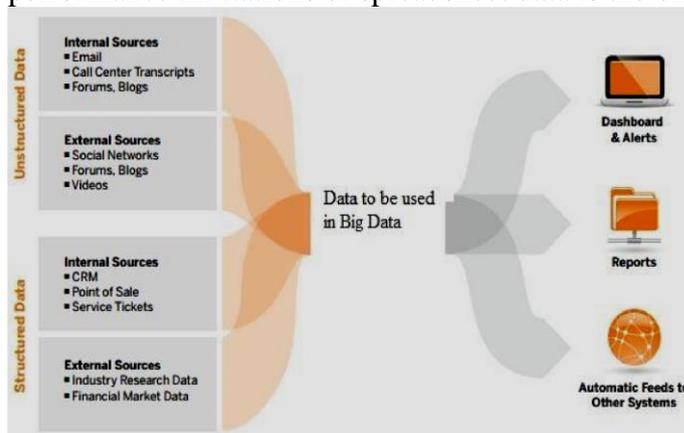


Fig. 6: Structured and Unstructured data type

Unstructured data cannot be so easily categorised and put in a clean box: photos and graphic images, video, instrument data streaming, web pages, PDF files, PowerPoint presentations, e-mails, blog posts, wiki and word processing document etc. all come under this. Crossing between the two semi-structured data. It is a type of structured data, but the lacks of strict data model structure. And semi-structured data or other types of labels are used to mark some aspects in the identification data, but the data does not have a rigid structure. For example, word processing software, they can now include metadata display the author's name and creation date, most of which are just unstructured text documents. There are e-mail sender, recipient, date, time, and other fixed fields to the e-mail message content and unstructured data of all attachments. Photos or other graphics can be tagged as creator, date, location, and keywords, making it possible to organise and locate graphics. XML and other markup languages are often used to manage semi-structured data.

The solution underlies in the problem itself. The research work proposes to study, identify the challenges encountered in Hadoop's heterogeneous clusters, study existing algorithms, design a new algorithm to chart off the problems that were met by the significant existing algorithms, and propose to develop a new method of clustering data over clusters in Hadoop that can provide a good throughput, low latency among big data.

2. Proposed Framework

TeraSort and TestDFSIO as benchmarking tools to analyse the depth of HDFS clusters in a heterogeneous and homogeneous environment. They have used the benchmark TeraSort to practically explain the scaling and functionality of groups in case of the data burst. The result reveals that a lot of data generation at a fast speed needs to be taken care of else there might be chances of node failures. The TestDFSIO is a benchmarking tool that is used merely to inject node failures to test the stability of the clusters. The benchmarking tool results serve a fundamental idea that homogeneous or heterogeneous nature of the groupings doesn't impact the performance until and unless the size of data is small. The moment the data size grows, the management becomes difficult, different processes require different job scheduling, and according to that managing, a Hadoop cluster for them is quite tricky. Therefore the hardware part of a Hadoop cluster can be removed to generate a more sophisticated and useful system. If the focus is shifted to the processing and clustering techniques, the right amount of improvement could be introduced into the Hadoop and Big Data environment.

The TestDFSIO is used to measure the I/O performance of clusters in Hadoop. It is also considered as a departure point because it doesn't reveal much about parallel processing. It merely tells the system about the possibility of node failures. The performance is also a deciding factor as the results depict that performance enhancements in cluster configurations are linearly related. There are not many studies in this field, but the value from that context doesn't help much. To identify the root cause, one has to look into methods the processing capabilities or techniques so that digitised data could easily be used for related purposes. The more the cluster nodes are added in a system, the more depletes the processing power of the node. In smaller data size, using MapReduce is a complete waste of efforts and functionality. But higher data size is the best input for MapReduce application processing. There is the requirement of design specified scenarios for analysis of dynamic data. One should test the working concerning hundreds and thousands of nodes for understanding big data.

a) Sharing information of different levels

Information levels, free information sources, and various information gathering environments, often information such as complex terms, such as missing / uncertain values. In other circumstances, to create copies of changed information, privacy concerns, sounds and errors may be introduced into the information. Safe and Sound Information Sharing Protocol is an important challenge. At the model level, the critical problem is to create models globally through the formation of an integrated approach by mixing the locally discovered design. To analyse the relationship relation between distributive sites and to achieve the model from the Big Data, it requires careful and carefully planned needs to analyse from multiple sources to analysis. At the system level, the necessary challenge is to have a data-data framework for the framework of time. The other needs of the necessary need are needed in the need of the need. Need is needed in the need of the necessary need. Needs need to be carefully designed, a system must be carefully designed so that the undefined information can make patterns related to their complex complicated relationships, by doing it by doing them in a simple way. By doing to explore Big Data, there are various challenges for information, models and system level. In order to support Big Data Mining, high-performance computing platforms require regular designs to make the full complete power.

b) Analysis of Data

Hydroponic load and behavioral research, MapReduce has begun exploration and may bring performance in the framework more quickly. Green computing area connected with this technology, which can benefit from low energy consumption from solid state discs. The green computing field is very new. It can represent a gap in the region that requires further research, or is in the early stages of research. New storage technologies are becoming cheaper, cutting into storage, cloud, and green computing will probably present new challenges to the research community, more searchable and more productive. Analytical process, large amounts of undetermined information for the data gathering and processing process has been a challenge.

Much information is generated from large data. They handle issues, processing problems, security issues, and storage problems. Each item has the ability to stay in big information and focus mainly on security issues.

A) Management Issues: The most significant data collection organization, public sector and large amount of structural, semi-structured and undefined data collection by private and public administration. The big data management policies ensure access to high data quality, information ownership, liability, standards, documentation and data sets.

B) Storage Problems: The storage is achieved by using virtualization in larger data, where it has a large set of sensor information, media, video, e-business transaction record, cell phone signal combinations. Many large data storage companies such as EMC, IBM, Netapp, Amazon, manage a large volume of data using NOOSQL Works, Samoa, Buy, Hadoop, Reduce map, and some tools like grid profits.

C) Processing Issue: Important data processing analyses large data size in case of batch processing or stream processing even in byte petabytes, xetabyte. Performance improvements in performance tuning system

D) Security problem: The lack of unwanted methods and disabled tools for security of a significant dataset, more threats and vulnerabilities in the public and personal database, lack of data volunteers and unexpected leakage and public and private policy hackers are able to hack their resources. Needed

3. A YARN job is executed with two kinds of resources

An application master (AM) is responsible for coordinating the application monitoring and cluster distribution executives. Some officers that are made by AM for a Map Reduce work; they will perform parallel maps or reduce operation. The slave net runs in both containers. Each slave node manages the node manager daemon which is responsible for creating a node holder. The whole cluster is controlled by a resource manager, which determines the allocation of the holder in all slave-nodes depending on the requirements and current charges.

Four types of asset allocations for cluster work must be configured correctly. These are:

1. How much memory can be allocated for YARN containers on a node? This limit should be higher than all others; otherwise, the holder allocation will be canceled and the application fails. However, it should not have full RAM on the node.

This value is configured in `yarn.nodemanager.resource.memory-mb` at `yarn-site.xml`.

2. A single holder can consume many memories and allocate the minimum memory. A holder will not be more important than most, or else allocation fails and always the minimum amount is allocated as RAM.

Yarn.scheduler.maximum-allocation-mb and yarn.scheduler.minimum-allocation-mb have been configured in yarn-site.xml.

3. How much memory allocation will be allocated to application masters? This is a constant value that should fit the maximum size of the holder.

It is configured with yarn.app.mapreduce.am.resource.mb at mapped-site.xml.

4. How much memory allocation or operation will be allocated on each map? It should be less than the maximum size.

It is configured by MapReduce.map.memory.mb and MapReduce.reduce.memory.mb properties in mapped sites.xml. The relationships between these features can be seen in the following picture:

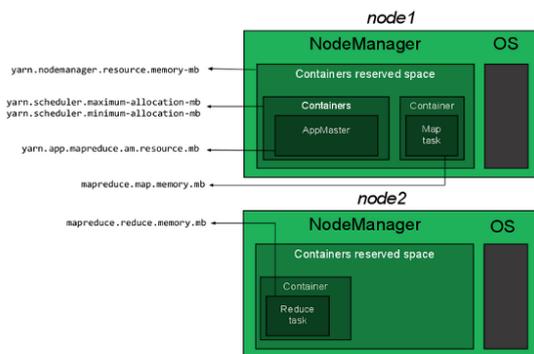


Fig. 7: Configuration for 2GB Node For 2GB nodes

Sample Configuration for 2GB Node For 2GB nodes, a working configuration may be:

Property	Value
yarn.nodemanager.resource.memory-mb	1536
yarn.scheduler.maximum-allocation-mb	1536
yarn.scheduler.minimum-allocation-mb	128
yarn.app.mapreduce.am.resource.mb	512
MapReduce.map.memory.mb	256
MapReduce.reduce.memory.mb	256

Fig. 8: Configuration for 2GB Node For 2GB nodes at yarn

The screenshot shows the 'Overview' page for node0:5000 (active). It displays hardware details such as Machine (VMware VM), Version (2.6.1), Operating System (Fedora Linux), and Block Pool ID. The 'Summary' section provides system metrics: Security is off, Swap is off, 2 GPa and 4096 MB of memory, 3 blocks, and 10 total filesystems. It also shows configured capacity (14.16 GB), used capacity (1.22 GB), and remaining capacity (12.94 GB). Other metrics include block pool usage, live blocks, and total disk space.

Fig. 9: Output of nodes

HDFS is a distributed storage system, and it does not provide any services for running and scheduling tasks in cluster. Role of this YARN Framework. The following section is about starting, monitoring and submitting YARN's work.

3 Result

Cluster Metrics							
Apps Submitted	Apps Pending	Apps Running	Apps Completed	Containers Running	Memory Used	Memory	
1	0	1	0	0	0 B	3 GB	

Cluster Nodes Metrics			
Active Nodes	Decommissioning Nodes	Decommissioned Nodes	Lost Nodes
2	0	0	0

Scheduler Metrics									
Scheduler Type		Scheduling Resource Type			Minimum Allocation				
Capacity Scheduler		[MEMORY]			<memory:128, vCores:1>		<memory:15<		
Show 20 entries									
ID	User	Name	Application Type	Queue	Application Priority	StartTime	FinishTime	State	FinalStatus
application_1507721641254_0001	hadoop	word count	MAPREDUCE	default	0	Wed Oct 11 13:39:33 +0200 2017	Wed Oct 11 13:40:13 +0200 2017	FINISHED	SUCCEDEE

Showing 1 to 1 of 1 entries

Fig. 10: Configuration for 2GB Node For 2GB nodes

3.1 Submit MapReduce Jobs to YARN

Yarn jobs are packaged into jar files and submitted to YARN for execution with the command yarn jar. The Hadoop installation package provides sample applications that can be run to test your cluster. You'll use them to move a word count on the three books previously uploaded to HDFS.

1. Submit a job with the sample jar to YARN. On node-master, run

```
yarn jar -hadoop/share/hadoop/mapreduce/hadoop-MapReduce-examples-2.8.1.jar wordcount "books*" output
```

The last argument is where the output of the job will be saved -in HDFS.

3. After the job is finished, you can get the result by querying HDFS with `hdfs dfs -ls output`. In case of success, the output will resemble:

```
4. Found two items
5. -rw-r--r-- 1 Hadoop supergroup 0 2017-10-11 14:09 output/_SUCCESS
6. -rw-r--r-- 1 Hadoop supergroup 269158 2017-10-11 14:09 output/part-r-00000
```

7. Print the result with:

```
hdfs dfs -cat output/part-r-00000
```

Fig. 11: Running of Yarn file

Conclusion

Unstructured data cannot be so easily categorised and put in a clean box: photos and graphic images, video, instrument data streaming, web pages, PDF files, PowerPoint presentations, e-mails, blog posts, wiki and word processing document etc. all come under this. Crossing between the two semi-structured data. It is a type of structured data, but the lacks of strict data model structure. And semi-structured data or other types of labels are used to mark some aspects in the identification data, but the data does not have a rigid structure. For example, word processing software, they can now include metadata display the author's name and creation date, most of which are just unstructured text documents. There are e-mail sender, recipient, date, time, and other fixed fields to the e-mail message content and unstructured data of all attachments

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A new learning model of the machine in the cloud for text classification and clustering of data Twitter for Business Analytics

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Sandeep Bhargav**

Abstract: In the last few decades, internet sites within businesses are attaining unprecedented fame as a result of its capacity for industry development. Organizations can find out about shoppers' emotions regarding their services and products, and also utilize it to understand the current industry enhance your manufacturer new. Hence, businesses regularly advertising their advertising and advertising and advertising campaigns and strategies centred on buyer tastes. Harness societal assesses and employs considerable quantities of info on societal websites into mine significant info for tactical decision-making. Programs methods and equipment learning programs to better successfully recognize tendencies and patterns to find actionable info. The record includes chosen a favourite foodstuff model name to estimate a provided purchaser critiques on Twitter flow. Numerous measures inside the classification and group of information had been useful for investigation.

Keyword: Twitter, Sentiment, Data analysis, text processing, Text classification.

1. Introduction

Twitter API can be utilised to amass corpus Twitter feed and also a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint data text-mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Numerous measures inside the classification and group of information had been useful for investigation. Twitter API can be utilised to amass corpus Twitter feed and also a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint info text mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Measures inside group and the classification of information had been useful for investigation. Twitter API can be utilised to amass corpus Twitter feed and also a classifier of binary shrub to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint info text mining investigation of Twitter

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and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Twitter API can be utilised to amass corpus Twitter feed along with a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint data text-mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Twitter API can be utilised to amass corpus Twitter feed along with a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization prognosis statistics text exploration investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Twitter API can be utilised to amass corpus Twitter feed and also a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint data text-mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Twitter API can be utilised to amass corpus Twitter feed and also a virtual tree classifier to observe that the lexicon of this polarity of both tweets from English, while favourable or adverse. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint data text-mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Foreign Exchange shrub to observe that exactly the lexicon of this polarity of all tweets from English, if negative or positive. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint info text mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject. Foreign Exchange shrub to observe that exactly the lexicon of this polarity of all tweets from English, if negative or positive. An approach utilizing k very related method of phrases to both set tweets as a way to discover true small business price. This report tries to test both the technical and small organization standpoint info text mining investigation of Twitter and urges appropriate foreseeable upcoming enhancement chances with the emerging subject.

2. Literature review

[V. Krishna Reddy et al. 2014] proposed testing cloud applications in cross cloud environment. Cloud computing has become the new way to provide services to users on demand services to users. The main goal of cloud computing is to support user services and real-world applications. Recently, a movement of the cross cloud also known by many names, including cloud, multi-cloud or others to take advantage of service providers and organize many offers for reliability and bounce cloud cloud.[17]

Cross cloud offers many advantages it offers services that benefit the user and the

organization and make services easier. Provide testing services in the cloud, e-commerce and other solution is not so easy because for this type of testing different tools, processes, techniques, application to create and build the application prototype. Cloud computing is a combination of computer concepts connected to the communication network in real time, which provides a possibility to use multiple services simultaneously on a single network.

The data as a service, infrastructure as a service are the services offered by cloud computing. For the verification of the performance of browser and browser type to perform with ease. For the implementation and delivery of these services with the scalability, flexibility, portability and capabilities of the system software, it is in our cloud. For all applications in real time and the challenges that comes with applications, cloud testing is an important solution for them. There are several types of technical tests and applications for troubleshooting and efficiency. Testing tools are used browser cloud for testing and performance in terms of efficiency. [17]

It includes many testing techniques as proof of application, preliminary tests, synchronization, distributed testing, etc. mobile cloud testing SOASTA tool is being developed for testing web applications in the cloud.

The testing process can be real-time processing technique and to run the real-time application. Cloud testing to provide hosted services on the Internet and providing services to user services, some of them are free and some customers have to pay the particular amount of money.

[**And S.Poonkodi. 2013**] proposed to provide a secure transmission of data in the proxy re-encryption system cloud storage system using threshold. Cloud Storage is also known as a large distributed storage system which includes many independent storage systems. Many third-party companies that provide storage services, but data storage or other third party cloud can be important issue of data privacy. For data security in the cloud user uses many methods to secure your data and most encryption technology that encrypts data using encryption methods used.[18] For secure data transfer companies use many methods. And the new threshold proxy encryption is one of them, is to integrate the system with a decentralized code with the help of many safe storage. The main problem of the Internet data transmission by the storage system. One key encryption is not enough for data security before if the data transmission at the time of cryptography to send the key to different servers and these servers are protected by security mechanism. However, this method takes a long time to complete the encryption process if the author considers the threshold of re-encryption method proxy and integrate it with a unique code to another storage system. [18]Integration Transfer high encryption, data encryption and data makes it effective to meet is sufficient for the robustness of the data, data privacy and data transmission system. Each storage system is autonomous and calculates the code word symbol for the received message symbol, and then completes the data encoding and storage process. This mechanism is the first four phases is the system configuration in this user runs the Setup algorithm and creates system settings. The user generates the public key, private and shared and divided the key servers with a different threshold. This user has created a text and sends the encrypted storage to servers at random. Transfer of user data a user sends data to B with the help of the secret key. A user requiring the shared key from the key server for the shipping data. And then analyse the data accordingly. A storage system includes a cloud storage server and key server and created a new threshold proxy re-encrypted technology.

Each data storage server encoding, decoding and each encryption key server and performs decryption and data and messages. Server acts as key threshold point before providing the interface layer as a traditional file system.

[**Gao and Jerry. 2013**] cloud proposed tests, problems, challenges, needs and practices. Cloud computing is the way to get resources how they manage data, data delivery technology and its solution. Cloud testing offers as a service, cloud testing is used for web testing, test applications based on the cloud. Also generalize the challenges, problems, needs test cloud at the time of the test.

Cloud testing offers multiple services and access to users that is flexible and scalable computing power. [19]It also includes many properties whose profession, independent feature, billing and connectivity with many interfaces and technology. Cloud is compatible with a large number of user accesses and provides services to users on demand. The first three types of clouds below them is the private cloud, the cloud is based on the private network behind the firewall. Another is the public cloud that provides cloud services are the ultimate hybrid cloud that includes public and private cloud.

Cloud testing is a type of software testing. Cloud computing environment simulate real user traffic such as stress, load testing and web testing. [19]The test is very important cloud software reduces costs and increase the efficiency of data concept testing. Service is available to a user by the third party validation or creates effective software based on Internet in real time online. Quality software you need functional or non-functional requirements. Cloud tests confirm the quality of the cloud based service and cloud capacity. Test Cloud check the quality of internal cloud as infrastructure and capabilities. Tests confirm the cloud cloud-based service applications in the cloud public, private and hybrid. Cloud has three types of test environment The first is the suppliers based on the test environment opaque this application using the Web-based application to validate quality in cloud infrastructures. Another is a test environment for public and private cloud provider uses this software to validate their quality. In the hybrid cloud environment the seller makes better use of cloud-based application to check the quality of infrastructure in the cloud.

There are several types of tests that focus on different test methods such as setting test service function developed in the GUI and the service function based on the API, integration testing focus on SaaS and cloud connection and the development of the functions of security testing service and cloud connectivity APIs, etc. Cloud testing requirements and have some new features. The cloud infrastructure test environment that uses cloud computing diversified and scalable resources, system tools and system infrastructure. The service level agreement in the cloud and the application provides services to end users and customers.

In cloud computing there are many problems and challenges also included. For example, in the construction of the demand environment defines all the tests in the cloud services on demand a cloud testing service usually happens now supports automatic provisioning of IT resources. In tests of scalability and performance of a large number of them realize the problem and its solution in the conventional software system and web-based software. Security testing and measurement clouds an important part in software and technology updated.

[**Aradhana Saxena et al. 2013**] security approach to data migration to the cloud. Cloud computing is a concept that is made by combining different concepts of IT and many

Internet technology, providing a platform for applications of agile and profitable business, etc .. In the present scenario of data migration security is the biggest concern for the user that uses the cloud to move your data and applications. Many companies and organizations put their efforts to reduce the cost of IT resources and thus join [20] IT organization and the use of virtualization technologies. Cloud computing offers a good infrastructure and a better cost for companies with reduced administration. Type of application and cloud computing platform is defined. As a platform as a service is configured and provide services for users when services can be physical machine or a virtual machine. It defines cloud applications accessed via the Internet and for this great server data server and power are used to host the Web application and the Web server.

Cloud computing is different from other paradigms cloud and scalable, which provides services to customers on demand and in particular how the claims. Cloud computing many organizations have security issues, including the sharing of resources with other companies without control, the incompatibility of service in the cloud storage, controls key cryptography, the data integrity, and legal government laws, license and Internet security status data.

The migration of data to the risk management of cloud computing may be qualitative or quantitative factors used. In this, the risk must be balanced against the guarantees and benefits with a better understanding of the security remaining with the organization. In the cloud the issue of data security is the biggest concern for all users, but each cloud service provider does not have access to the central data system of physical, because it depends supplier infrastructure to ensure complete data security. Infrastructure provider follow specific objectives to protect data and ensure privacy by using, to test the binding of the available data is changed or not used auditability. With the help of encryption algorithm users can easily achieve confidentiality. Cloud requires remote attestation Trusted Platform Module to create a tamper-proof system as virtualization security system proof. Platform virtualization [20] it must be safe with the help of virtual machine monitors. Virtual machine migration should be allowed only if it is based on both servers of the sender and receiver. Cloud migration is the highest point where the cloud manager encounters major problems when migrating data from the server of a company to another server. Cloud acts as an interface with the company to access your data on the virtual network and access their data. If a problem occurs when the data migration that can cause many security problems and other problems that are not in favour of the company. [20]

Many financial companies such as banks, finance companies do not believe that third-party vendors in the cloud and others. They are considered cloud services on their website and other required security applications, but these companies do not use cloud services for other financial services such as financial information and payment. The transition of data, applications and other services in place behind the premises behind the firewall to the cloud, where information can be provided depending on the application on the Internet. Cloud computing includes benefits which uses the encryption algorithm to secure data at the time of data migration. On the basis predicate encryption (PBE) shows the asymmetric encryption technique that allows the access control as part of the cryptographic algorithm. The predicate of game-based encryption is based identity encryption (IBE). PBE is a mixture of EBR and EBA (Attribute Based Encryption). They are used to design the decryption keys and encrypt simple text messages.

[**And Nguyen Khac Chien. 2015**] migration algorithm proposed effective virtual

machines based on minimizing migration clouds. [21] Migration cloud virtual machines is important to resolve issues such as load balancing, proposed by the overloaded virtual machine server, where the server can migrate your workload server before the maintenance release of the server. In many server-storage devices cloud computing, and other network applications, they can easily be virtualized. Virtualization provides many benefits, such as the use of the source, probability. System reliability, application isolation, management, and performance improvements and other benefits. In the cloud when the operation of the data center, as problems arises and the problem of energy have a good role?

The integration of the virtual machine on the physical server has a light load and then uses live migration to low-energy transition state server to stand in a particular state. It is useful for service providers for the use of clouds and minimizes energy consumption. In the virtual machine to a service surcharge on the virtual machine migration has a greater capacity and cloud services provider finish quality of service and user. Live migration has three facilities in line, the first is to balance load second line maintenance and the last is the energy management. Online maintenance improves the capacity and reliability of the system must be connected to the user, [21]

This author is an algorithm, that algorithm is described that if the virtual machine to migrate data from one server to multiple servers that require more resources, but the migration of data to a server that does not use the resource. The particular number of virtual to improve the performance of the migration machine. Using this algorithm improves utilization. And minimize the violation of a service level agreement.

For load balancing, virtual machines data transfer, the host application of high loaded from a server in charge. And management of the energy used for energy conservation and energy. To the author of the high load server faster data migration server as consider a high speed data algorithm, better management, and the minimum time and data security. Also increase the speed and the task manager uses the effective migration algorithm of virtual machine decision.

[Alkhalil Adel. 2016] proposed a decision-model- cloud computing migration. The development of cloud services is better for IT architecture and resources, create new services and quality of IT resources. Cloud services increases the capacity of the system and system services. And it offers a good quality of service, high performance and cost of service. A cloud of KBDSS (of decision support knowledge based system) provides the flexibility to meet the demands and cloud solution organization. Therefore develop a model of cloud Copyright migration method, it takes three. The first method is the motivation and the problems that affect the data migration. The main concern of any organization is identifying user demand with the development of the model. And reducing security costs resourcefulness of data is an important part of the data migration.[22] .The second is the different departments within an organization, including IT, security and cloud provider and many others. According to the author of the user have a greater expectation of a cloud over what they have with the local data centred. The third part is a model process of decision making that includes three components of intelligence, design and choice.

In fact, reach agreements with the "reality" of the concept of the company or organization, including problem finding model, gathering information, planning company, the objective of the business and its future decisions need. Author describes the model process of migrating to the cloud has four main components: sources KBDSS, knowledge base, and migration to the cloud. The sources of information requires a lot of details that project

documents, cloud offers, detailing experts, rules and regulations, white paper and information system decision support cloud. KBDSS second component controls all documents and properly verified before being stored in the third knowledge base component. Knowledge base is an important part of the decision process model, deciding that the required information where and when and representation of documents. The fourth process of cloud migration components has six stages, the business strategy, cloud environment, service, risk analysis, evaluation and implementation providers. [22]

For the best companies make plans and secure migration strategies and valid data. The strategies include mainly the cost reduction method, business innovation with the backup plan. In security policy, essentially all liability for security problems vary three cloud computing models such as SaaS, PaaS, IaaS and. Provide safety data businesses algorithm uses many security and privacy and other services such as encryption, key generation, encryption, and many other algorithms that are useful for the secure transmission of data migration or data. At the time of the migration monitoring data through resources, it is very important because many virtualization methods of sharing resources and cloud computing can affect the performance data migration to the cloud and data abjection can cause slow response and lack of availability of data via the Internet. For better data migration performance using cloud computing data distribution server and application and database. Data provides better performance with reliable, scalable data. Cloud services do not need sales service costs only comes to the use of data through the cloud that includes applications, servers and others with fixed amount payable. These cloud services are so expensive to use. For a full analysis of better service through the Internet some necessary services, such as data security, data and adaptation of relevant standards. He concludes that data migration by cloud computing and dynamic decision is difficult. It requires decision support system for better understanding and decision making. With services such as intelligence, design and choice, data migration becoming a cloud support. It requires decision support system for better understanding and decision making. With services such as intelligence, design and choice, data migration becoming a cloud support. It requires decision support system for better understanding and decision making. With services such as

[And Noor Ibrahim Hussein. al 2013] proposed requirements of the migration of the security of the existing system and cloud. Cloud computing is a competent technology and beneficial technology. Benefits for many companies and organizations are provided. Business system migration process to the cloud is very difficult to treat more than migrating a cloud server to another server in the cloud. Because it does not show the location of data and process data at the time of migration, but shows the selection of data migration data planning and data transmission from the server to the cloud server inherited. Data migration requirements are the requirement of data security at the time of migration. Security problem is the problem for enterprises, organization and the user as well. This document represents the safety requirements before, after and during the migration of data from the business system cloud server. And when the server cloud data migration to another cloud. [23]

With the help and the proper use of resources with better efficiency of cloud computing data get a good financial improvement in the cloud environment. Basically cloud end of separate calculation into four types, such as private cloud, public cloud, community cloud and hybrid cloud. In the public cloud environment is accessible to all those who want to

use the service in the cloud, and business, government, other academic. It is accessible, organized and managed by them. Private cloud is accessible only with the particular person who is authorized by the company or owner of the cloud server and provides user authentication. Community cloud is a community-based cloud services [24] Cloud migration of data is the data transfer process. What can IT organizations do to the cloud, a cloud server to another server in the cloud or a cloud server many cloud servers? With the help of migrating user data, you can transfer data, applications and other documents to be transmitted in the cloud environment. In this article, the author describes two types of migration services in this One is the migration of data from the system organizations to a cloud server and the other is a cloud to another cloud server.

Data migration is a term of the transfer of data from one place to another. Cloud migration for three basic conditions are important, including data migration, data integrity and data security. Data integrity improves the accuracy and consistency of data. And data security ensures data security during data migration and security function data at the time of data migration.

The migration of the organization system data to the cloud server is the data organization processes, such as applications, services and FIREWALL on-demand services to the cloud, where the information you can provide the use of Internet on demand. Data migration from one server to another cloud server cloud enables the organization to change the service provider cloud to another without transferring data at home. It is a service to the minimum cost of customers with more benefits and other beneficial services. Before migrating data that is not based on a single service provider. In this case, the data are based on a single service provider, where the data can be transmitted to different clouds. To address the issue of security, including fault tolerance, service availability and data integrity and confidentiality of data [24] a basic model to manage the security issue is used. It includes trust, knowledge of rules and regulations, and to the user. It includes the provision of Internet security, use encryption system files, backup and update the browser.

[Dinesh Goyal et al. 2014] improving the safety offered for migrating data using the process several random key encryption levels. With the development of information exchange Data security has become an important issue for the security of data or move the application and data server that the user or organization can not rely on external Auditor (TPA) with the issue of confidentiality. Data migration is a method of transmitting data of a computer system to another or to another cloud server. [24] to the art of effective data migration of data from one system to another system, it provides the loading of data and extraction of data. Design data include all details the system and the system formats, system requirements, specifications, and other necessary details. It can provide data validation process to confirm the data migration and the migration process. After migration assay techniques such as manual and automated testing improves quality and data reliability and reduce unwanted information.

Data migration follows certain steps including design, extraction, cleaning, loading and validation of data at the time of data migration and repeats all steps until the data reaches the destination. The data migration method involves the necessary information before migration. In what the user knows and define the structure of the two sources of the system and destination, the mapping information between the system and the data migration process. To define the structure of the source and the target system. The source collects information on the target system and understands how it works and the use of system

documentation and other details of this system.

Many large cloud applications is the growth of the company and other benefits. Data migration is the data transmission process can migrate IT organizations data to the cloud server and the other can be a cloud server to another server in the cloud. But with many problems, such as data integrity, security, data privacy and accuracy of data migration data, it is difficult.

All data have different importance and require different types of security for all data. For data security companies that are used to configure the encryption keys for data encryption.

3. Why Twitter data used for business analysis

Twitter is a microblogging tool online that promotes more than 400 million messages per day, including large amounts of information on almost all industries of entertainment, sports, health, and business and so on. Perhaps one of the best things about Twitter - perhaps its greatest attraction - is its accessibility. It is easy to use for sharing information and collecting it so much. Twitter provides unprecedented access to news, along with our legislators and our celebrities and events. Twitter also provides an important source of business models for large company information.

The actual features make twitter the best place to get the latest real-time data and analysis of real life and research. If you need other data sets, you can download data sets pre-out in various applications, such as Q and A detection of cancer data set in chat bots sports commentary. Or if you have a single use case you can create your own database for it. It can be used as an annotation tool Data trans to download images from the web and create large data sets at any time to manually load the raw data and label a spell.

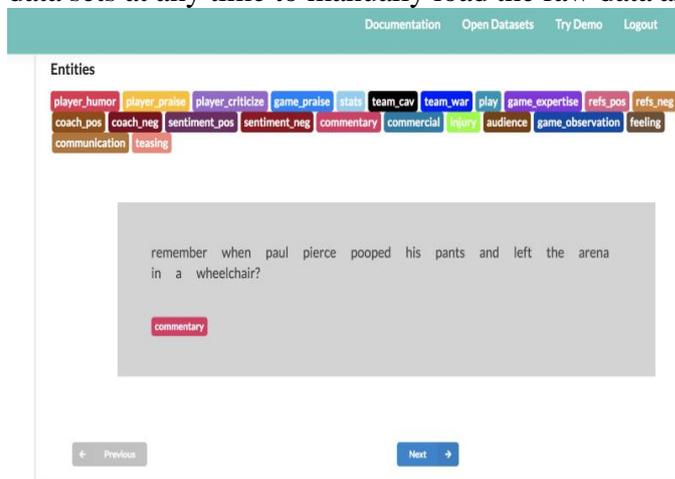


Fig: - 01 Twitter application data set overview

Data set

In order to extract data from Twitter we need to create a Twitter application.

Steps to Create a Twitter application

1. Navigate with my applications

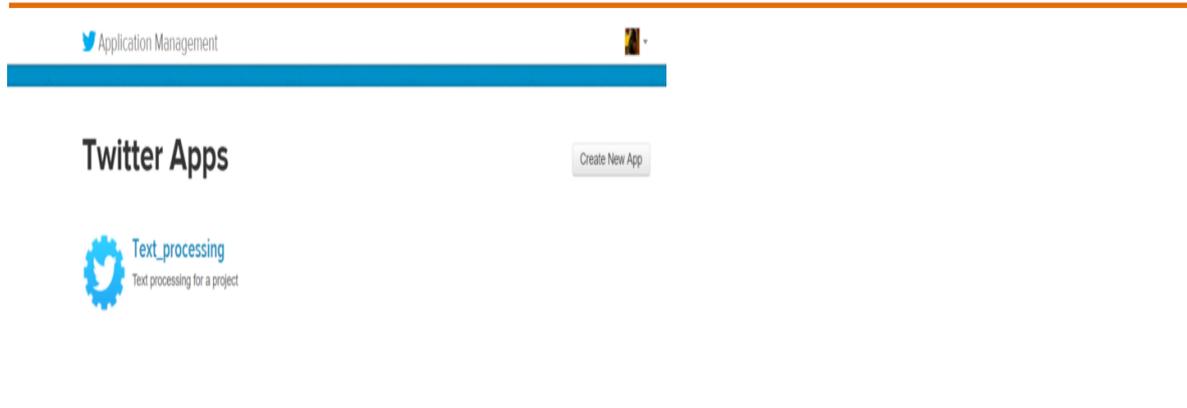


Fig: 02 Navigate with my applications

2. Since we already have this created application, which appears on my page. Click "Create new application".

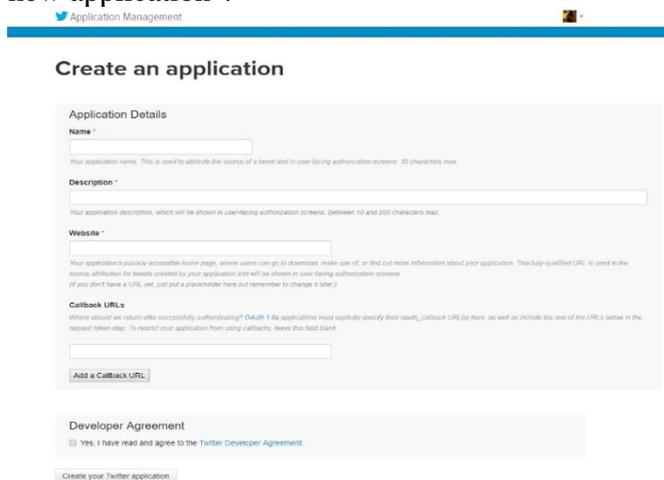


Fig: 03 create an application over Twitter

Fill in all the details of the application.

3. Once all the data has been completed and verified was given the keys of customers and access.

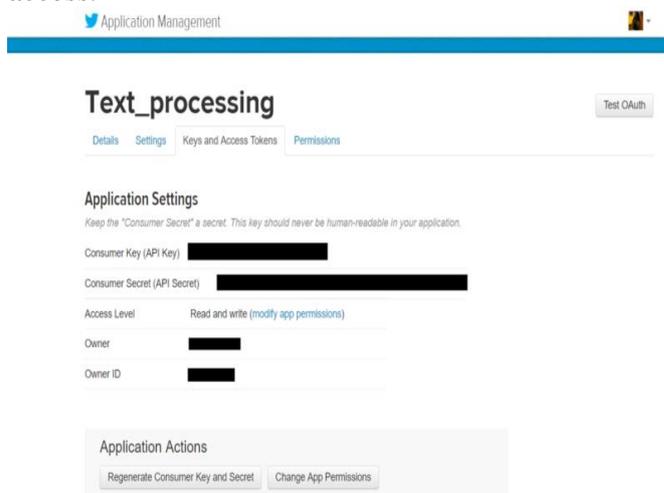


Fig: 03 Step for Twitter text processing

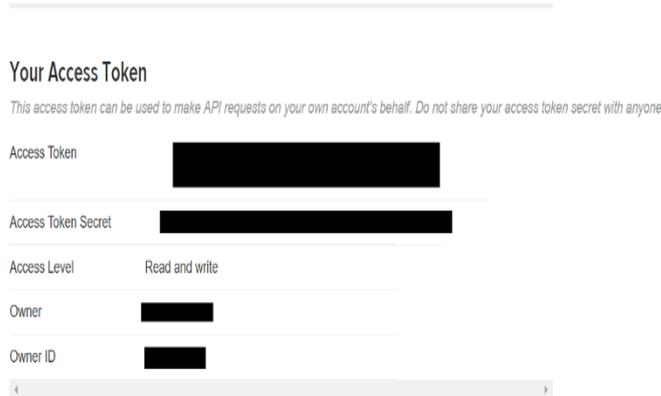


Fig: 04 step for access token analysis over Twitter

3.1 Extracting tweets using a hashtag in particular

Convert these data extracted from a data frame that makes it more readable and easier to work.

Here it is how the data would look like:

id	text	favorited	favoriteCount	replyURL	created	truncated	replyURL	id	replyURL	statusSource
1	@Twitter: Google is offering Cloud credits and...	FALSE	0		2018-08-01 04:43:18	TRUE		10451154501040460		
2	My Google Play Store has been hacked from some of the...	FALSE	0		2018-08-01 04:43:18	TRUE		10451154501040460		
3	@Google: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:22	FALSE		10451154501040460		
4	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:15	FALSE		10451154501040460		
5	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
6	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
7	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
8	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:22	FALSE		10451154501040460		
9	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:22	FALSE		10451154501040460		
10	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
11	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
12	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
13	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
14	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
15	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
16	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
17	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
18	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
19	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
20	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
21	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
22	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
23	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
24	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
25	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
26	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
27	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
28	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
29	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
30	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
31	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
32	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
33	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
34	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		
35	@Twitter: Hey! We're looking for your help. We...	FALSE	0		2018-08-01 04:39:18	FALSE		10451154501040460		

Fig: 05 extracted from a data frame of tweet

It is very clear that the text section of the information we need to process is that many special characters and unnecessary information that we need. Therefore, it becomes very important to pre-process this information and then we can continue with the analysis.

Here is a code for removing pre-processed data and tabs, spaces, links, etc. it is shown this section can be modified according to your needs.

4. A little more than pre-processing - Removal of empty words

4.1 Stop words used on Twitter

When working with text mining applications, we often hear the word "close the Sound" or "close the list of the words" or even "stop list". The sounds are not just a set of commonly used words in a language, not just English. The fundamental reasons for the sounds of many applications are that if we delete commonly used words in the language given, we can focus on important words instead.

The words are generally regarded as "one set of words." Actually, you can have different meanings in different applications. For example, in some applications, there may be a list of

words suitable stopping for removing all empty words of some adjectives (eg, good, beautiful) to propositions (eg up before) from decisive (for example, A, A). Although some applications, this can be harmful. For example, in the sensitivity analysis, and the exclusion of 'good' and 'nice' adjectives, negative algorithms can throw near their tracks as 'no'. In this case, you can use a short list of coordinator adjustment stop with prepositions or adjustments based on application requirements.

We have finished pre-processing of data, and are willing to do some analysis.

Data visualization (charts, graphs, infographics and more) give an important way to communicate important information in an eye of analysts. If you want a impressive format to highlight important points in the text display, a sound can be used by cloud smooth the data and provide important information immediately.

Clouds of words on Twitter

Clouds sound (also known as a cloud of text or tag cloud) works in a simple way: A specific word appears in the source text information (such as a conference, blog or database), which looks bigger and bold to sound clouds.

So we will produce some cloud of words and continuous and important terms can be used in quotations that we have quoted.

Introduction to sentiment analysis:

4.2 Sentiment analysis

Feeling emotionally related; Attitude, emotions and opinions sentiment analysis refers to the practice of applying techniques of processing and analysing natural language text to detect and remove the information from the person from a piece of text. Opinion or feeling of a person is mostly on behalf of the subject and not the facts. Which means it can be extremely difficult to analyse the opinion or personal mood of the individual from a part of the text. With sentiment analysis from the point of view of text analysis, we are basically trying to understand the attitude of an author on one part of the reader and its poles; if positive, negative or neutral In recent years, citation analysis has increased interest in applications for brands, companies and researchers interest and business analysis. Business world today, looking for "business ideas" in the case of many of these streams of data analysis.

Regarding the analysis of feeling, I'm talking about the customer, what customers want, what customers like and do not like about products, their trading signals, their decision process, etc. The clients whose businesses meet these companies for business

I used the analyser incorporated in R sensation, which uses the dictionary of words NRC sensitive to calculate the presence of eight different emotions and text related variations.

from the following plot Insights Analysis of Tweets with Google, it is observable that Google has a positive effect on customers and is extremely reliable for them. Recently there are several expectations about your product or company employee or any other possibility.

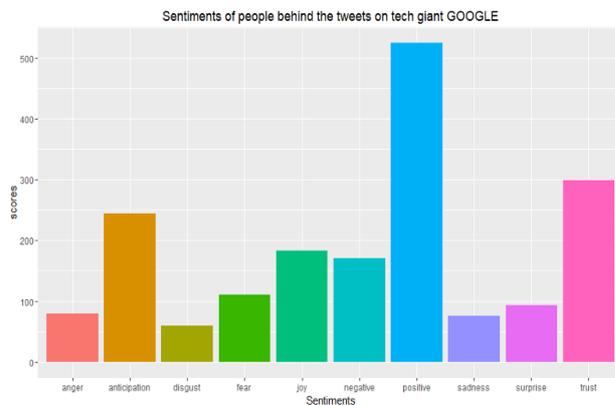


Fig 06: Sentiment analysis of Socila medial like google

From the following plot Analysis of Anxiety Tweets # Amazon, you can see that maximum tweet of e-commerce giant is positive and as Google did win the trust of customers. Apart from this, customers have significant amounts of pleasure.

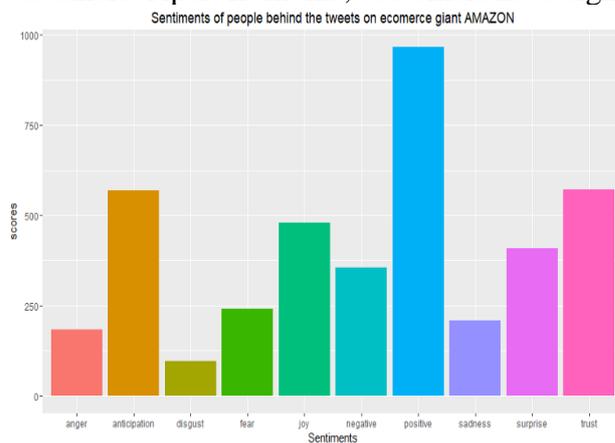


Fig 07: Sentiment analysis of Socila medial like amazon

Tweets # of Facebook shows a slightly different trend. Recently, there are many negative feelings associated with tweets on Facebook. However, the company has a confidence as well.

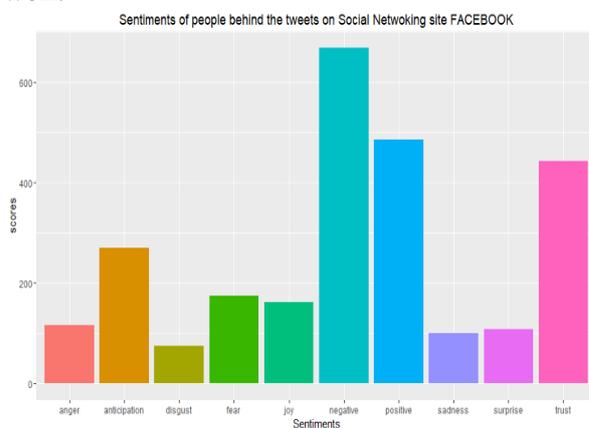


Fig 08: Sentiment analysis of Socila medial like facebook

In general, technology tweets have a lot of positivity and confidence among people worldwide.

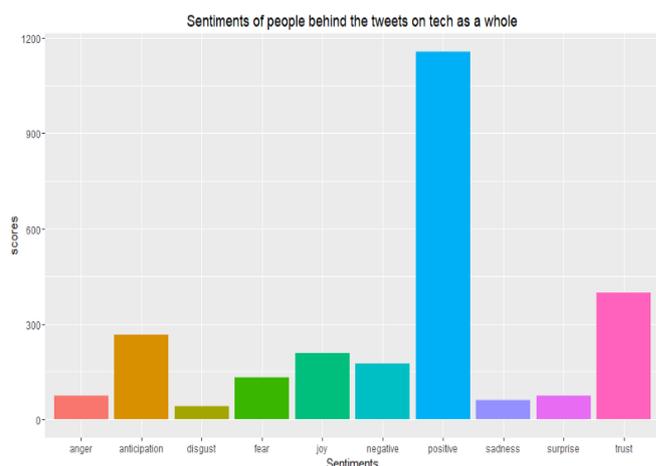


Fig 09: Sentiment analysis of people over Twitter

These are just very obvious feelings I have described. You can always look at the views and draw several conclusions about the data.

5. Conclusion

Word processing and research evolves by feeling harsh discipline with a lot of challenges because it includes processing of ordinary speech. It is a wide range of software you can get from the results themselves, including, for example, for analysing information, promoting example, readers respond problematic perform. Get essential opinions of the views expressed around the World Wide Web in particular weblogs social networks is essential for many organizations and associations, while it is in relation to the comments of raw materials, layout people, or comments shareholders

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An Efficient Resource Allocation for Heterogeneous Workloads in IaaS Clouds over AWS

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Sandeep Bhargav**

Abstract: Infrastructure-in-service (IAAS) has attracted a lot of attention from cloud technology users, who claim a large number of computing resources. Current IaaS cloud resources are associated with virtual machines (VMs) equivalent processing configurations, where VMs have the same components as a real machine (PM) capability in VMs. However, the majority of the user's work demands different amount for different organizations. For example, more CPUs are needed for high-performance-computing work when more memory is required for large data processing applications. The process of allocation of existing monetary resources creates appetite, where dominant wealth is hungry and non-influential resources are damaged. In order to overcome this problem, we propose to offer a different resource allocation method called Screens-Affinity Multi-Resource Alkonation (SAMR) to allocate resources according to the diverse needs of different types of resources. Our solution includes a VM allocated algorithm that avoids the use of SCISS resources in PMS and the appropriate creator is assigned a Model-based approach to accurately predict the proper PMS for running SAMR. We display less complexity for our model-based approach to real operation and accurate estimation. The broad simulation results show the efficiency of SAMR and the performance advantages on its opponents.

Keyword: Cloud computing, Machine learning, Data Analysis, Load balancing

1. Introduction

Cloud computing [1] [2] [3] word has changed the classical computing environment in IT industries. It is most emerging & popular technology in IT & research field because of its great feature such as virtualization and on-demand resource allocating (dynamic). Now - a - days because of increased use of internet the associate resource are increasing rapidly and this generate high work load. a simple cloud network is shown in fig.

BASIC CLOUD MODEL



Fig 1 - Basic cloud model

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To provide the reliable service to client with QOS [5] the load balancing mechanism is necessary in cloud environment, to prevent system from overloading and crash an auto scaling mechanism must also be provided according to the application and incoming user traffic. Load balancing mechanism provides the distribution of load among one or more nodes. For efficient service model auto scaling feature also enabled with the load balancer to handle the excess load. Auto scaling scaled-up and scaled down the platform dynamically according to the clients incoming traffic this save money and physical resources. Latency based routing is the new concept in cloud computing which provide the load balancing based on dns latency to global client by mapping domain name system (DNS) [10] through the different hosted zone.

2. Literature Review

2.1 Load balancing

Load balancing is the technique of redistributing the total load among the individual nodes of the cloud collective system to improve the response time and utilization of resources. Simultaneously avoiding condition which include some overloaded nodes while other nodes of system is free or under loaded. Thus it improve the overall performance of the cloud network, load balancing is a challenging task in cloud computing because it ensure the stability of system & user satisfaction. It includes fault tolerance, throughput, and reliability. Load balancing can be initiated by either sender our receiver. A load rebalancing is a generic expression of distributing high processing load among the different nodes. Load balancer can be cooperative or non-cooperative & non- cooperative. In cooperative load balancing all the node of the system must work together to achieve optimization of response time .while in no cooperative each node is free to process individual task to improve the local task response time.

In this article we will discuss different type of load balancing technique and their significant and will propose a load efficient model using cloud services.

1. Load balancing algorithm for P2P in dynamically structured system: this algorithm is proposed by the Brighten for load rebalancing in dynamic point-to-point system. This proposed algorithm save load information of node in multiple directories .these load information is used to schedule reallocation of virtual servers to form a good balance. This proposed method also uses the Greedy algorithm to utilize the node properly. This method was proposed to handle the various issues such as random load of node, scaling capacity. Advantages of this technique are high utilization of node and increasing scalability. Lacking factor is the reallocation of virtual server is tuff.

TABLE I
COMPARISON TABLE OF LOAD BALANCING TECHNIQUES

Load Balancing Methods	Parameters	Merits	Demerits
Fast Adaptive Load Balancing Method [5]	Efficiency Communication Cost	Faster Balancing Speed High Efficiency Low Communication Overhead	Cannot Maintain the Topology of Cells
Honey Bee Inspired Load Balancing Method [6]	Makespan Task Migration Execution Time	Maximizing the Throughput Waiting Time of Task is Minimum Low Overhead	Low Priority Load Become Stay Continuously on the Queue
Dynamic and Adaptive Load Balancing for Parallel File System [7]	Throughput Response Time	High Scalability Reduce the Decision Delay Better Resource Utilization	Degradation of the Whole System due to Migration Effect
Equally distributing current processing	Number of Migrated Users Number of Overload Servers	Require Very Little Amount of Calculation High Speed	Wastage of Time Network Delay is High
Load Balancing in Massive Multuser Virtual Environment [8]	Clustering Coefficient Number of Links Shortest Path Length	Network Becomes Reliable Efficient Routing Fault Tolerant Network Becomes Resilience	More Time is Used for Balancing the Load.
Load Balancing in Dynamic Structured P2P Systems [9]	Node Utilization Load Movement Factor	Increasing Scalability High Node Utilization	Assignment of Virtual Server is Difficult

Fig 01: Comparison of Load balancing technique

2.2 Auto scaling

Elasticity is the main attribute in the context of cloud computing and scalability is the key benefits provided by cloud. In big organization the enterprise application that use cloud network need a quality of service bond between client and cloud service provider. Backup path, scalability & availability of service are necessity for deployment of any application on cloud. Auto scaling technique ensures the QOS agreement between client & service provider. One can define auto scaling as the technique used to full fill requirement of on demand resource allocation when incoming traffic is increased and remove extra free resource when application is not have peak load means scaling up & down the system.

Earlier technique to achieve scalability was manually scaling the infrastructure to handle the peak load. it include the purchasing and installing the infrastructure during the peak load. Main drawback of this manual scaling technique is waste of money and resource. As the application don't have high request rate (load). That why we need such mechanism that can manage use of resources dynamically according to load. But auto scaling is not possible without the virtualization, useful concept provided by Amazon EC2 which is a cloud service provider.

3 Proposed System

Cloud computing is new and evolving technology conceptually a elastic & distributed model of distributing the resource over the network (cloud computing). System component must be cooperate to handle the request from cloud computing thus intercommunication between different resource hardware and software components is required to fulfil the client request. If the no of client requests become large it will create a bottleneck problem in the system, resulting the imbalance system in which some node is overloaded and other either don't have any work load or have only light load. This is called imbalanced system. To handle this issue we need an efficient load balancing technique. As the use of cloud computing increasing it demands the efficient resource provisioning. Lots of technique is proposed to ensure the proper load balancing but following issue has not been resolved full.

- I. Data availability issue
- II. Ensuring proper scalability to handle the excess load
- III. Ensuring the proper authentication, auditing , authorization
- IV. Ensure system stability and steady operation
- V. Proper monitoring of load

Load balancing is the most prevailed challenge as work load pattern is not predictable and node in cloud system has different capacities. To develop an efficient model by using cloud service we will tack care of these issues

- Load prediction
- System performances
- Load comparison of different node to balance load on light weighted node
- Intercommunication between load to transfer the load
- Scaling properties

3.1 System architecture

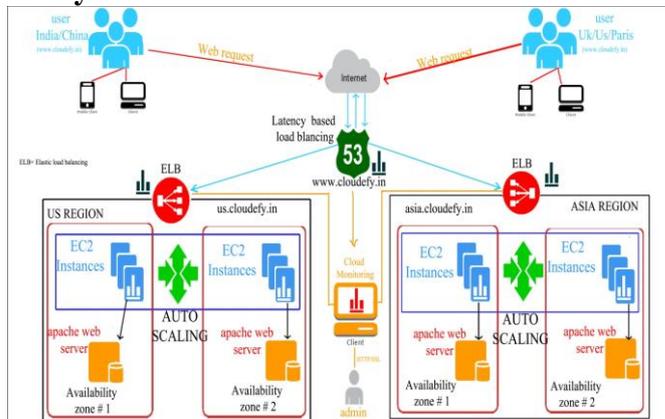


Fig4.1 – proposed system architecture

Abbreviation meaning used in picture

- ELB = Elastic load balancing
- EC2 = Elastic cloud commuting
- 53 = Amazon 53 routing (latency)
- HTTP = Hypertext transfer protocol
- SSL = Secure socket layer

The system architecture is show in above picture. This proposed system aimed for public cloud in which large no of nodes are connected in distributed manner. This system divide load balancing into 3 step to provide efficient solution to above mentioned issue this can be done using public cloud services .we will use Amazon web service’s networking services to balance the load in the proposed system this services individually does not provide any beneficial solution for cloud computing but if used together we can configure a smart load balancing system. This research will present an analysis of Amazon web service’s networking services.

4. Implementation

Proposed system is aimed to solve the issue of load balancing in public cloud, as load balancing is very important factor to ensure on demand and reliable service to user. Implementation will be done in following steps.

- Creation of cloud environment (Instances creations)
- Setting up main load balancer (latency based)
- Creation of round robin based regional load balancer
- Setting up Autoscaling group
- Resource monitoring
- Load generation and testing

4.1 Creation of cloud environment (Instances creations)

To implement the proposed work we are using the Amazon Web Service cloud environment. AWS provides the multiple instances according to the need of application. Basically AWS is an infrastructure as service provider so creating instance become very easy. AWS provides the service in different service regions and availability zone so first we need to select the availability zone

i) Service regions& Availability zone: service region is the geographical area where it’s all data and applications is stored and managed. Same as availability zone is subset of a

service region AWS has 7 service region and multiple availability zones. In this work we used two service region US and ASIA and created 2-2 instances in these service regions service region can be selected by EC2 console navigation bar.

ii) Operating system and AMI: after selecting the service region we need to select the operating system and software packages for our virtual instances this can be done in two way in traditional way one select OS and software individuals while in other way one use Amazon machine image (AMI) which is a pre-configured of software packages or we can say a template of previous instance. in this proposed system we are working on Linux instances based on Ubuntu server

Availability zone	Service region
ap-northeast-1	Asia Pacific (Tokyo) Region
ap-southeast-1	Asia Pacific (Singapore) Region
ap-southeast-2	Asia Pacific (Sydney) Region

Fig 2 - an example of service region and availability zone

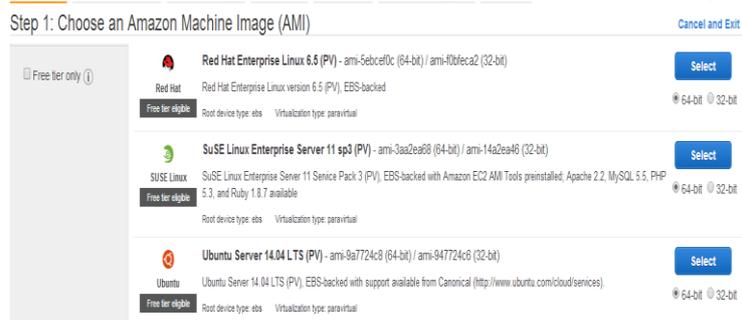


Fig 3 -AMI selection

iii) Selection of instances type: AWS provides the multiple type of instances in terms of no of ECU, vCPUs, memory. We have selected general purpose small instances as shown in fig.

Currently selected: m1.small (1 ECUs, 1 vCPUs, Intel Xeon Family, 1.7 GiB memory, 1 x 160 GiB Storage Capacity)

	Family	Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)
<input type="checkbox"/>	Micro instances Free tier eligible	t1.micro	up to 2	1	0.613	EBS only
<input type="checkbox"/>	General purpose	m3.medium	3	1	3.75	1 x 4 (SSD)
<input type="checkbox"/>	General purpose	m3.large	6.5	2	7.5	1 x 32 (SSD)
<input type="checkbox"/>	General purpose	m3.xlarge	13	4	15	2 x 40 (SSD)
<input type="checkbox"/>	General purpose	m3.2xlarge	26	8	30	2 x 80 (SSD)
<input checked="" type="checkbox"/>	General purpose	m1.small	1	1	1.7	1 x 160

Fig: 4 selection instance type

iv) Configuration of instances and security group: in configuration part the availability zone and network and the additional monitoring system is configured, no of instances in same availability zone, additional storage space can be added here. Security group is the defined set of rules for firewall to differentiate the incoming network traffic for example in

this proposed work we have used two protocol http for web server traffic and SSL for accessing the instance. security group provides the privacy and authenticity in Amazon web service only the authorized having the security key can access the instances . In second image 0.0.0.0/0 means traffic from internet source. By modifying this we can also decide that who will access our services

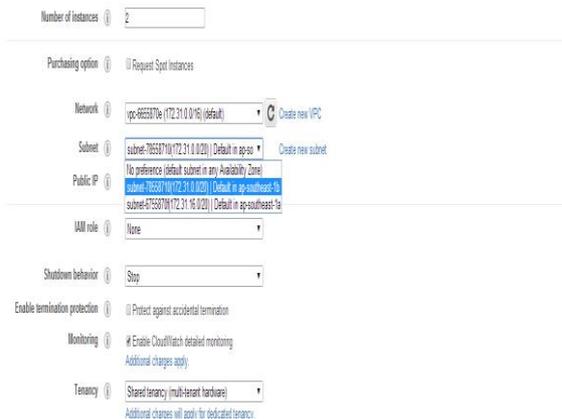


Fig 5- configuration of instance

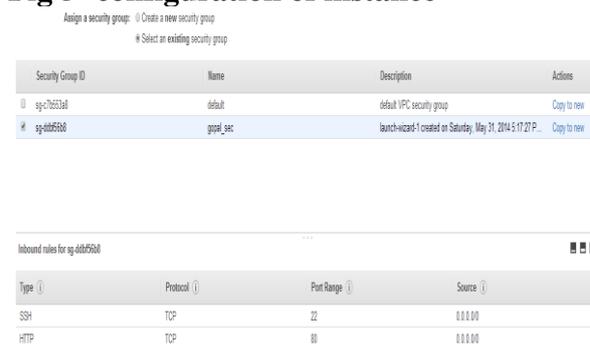


Fig 6- configuration of security group

V) Review of instances: here we can change the setting of our instances before launch

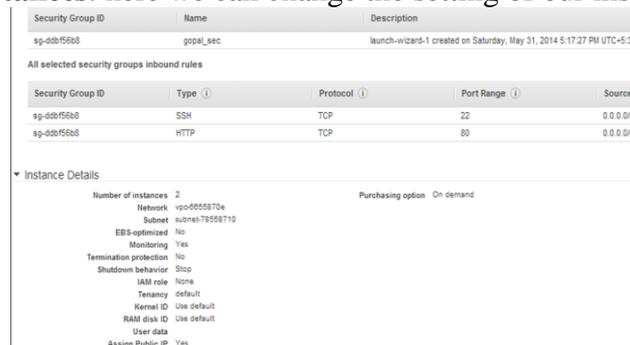


Fig 7 final review of instances

4.2 Setting up main load balancer

This main load balancer is the key step in our research. It is a software load balancer based on latency. Latency is the time of processing the request from the client. Or the time required by a request to returned to the user. This load balancer user the cloud dividing technique in which whole cloud is divided in different service region. And load balancing is done according to latency of the request. Amazon's route 53 can be used to create

latency based load balancer. It is a scalable domain name system. Which provides the routing between the different hosted zones.

i. Creating the hosted zone – hosted zone is the sets of record same as the record files in the DNS System. To create hosted zone we need to register the domain name we have registered the www.cloudefy.in.

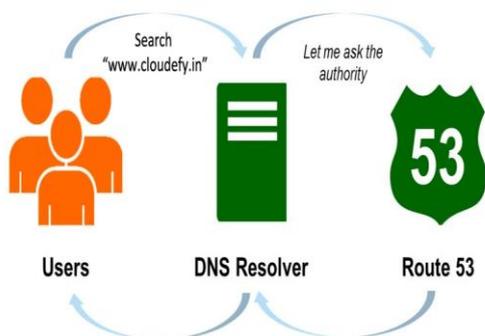


Fig6.7 – working of hosted zone

After successfully registration with the registration id the hosted zone is created by clicking the create hosted zone in navigation bar in Route 53. When hosted zone is create 4 name serve and 1 SOA server is automatically created by AWS to resolve the name query.

ii. Creating resource record – this is the main part of this load balancer here the instances and the regional load balancer is integrated together mainly there is 4 type of record set AAAA name , CNAME, SOA, NS. In this project first we created two A NAME ALIAS record us.cloudefy.in which target the DNS address of load balancer in US region and asia.cloudefy.in which target the DNS address of load balancer in ASIA region. This targeted address known as Alias records. To perform latency based routing we created two CNAME, a CNAME is the DNS record which point out the IP address hold by another domain. Here we create two CNAME www.cloudefy.in, as shown in fig.

Name	Type	Value	Evaluate Target	Health Check ID	TTL	R
cloudefy.in.	NS		-	-	172800	
cloudefy.in.	SOA		-	-	900	
asia.cloudefy.in.	A	1.# ALIAS singaporelb-51125273.ap-southeast-1.elb	Yes	-		
us.cloudefy.in.	A	2.# ALIAS go1b-1842492218.us-east-1.elb.amazona	Yes	-		
www.cloudefy.in.	CNAME	us.cloudefy.in	-	-	300	us
www.cloudefy.in.	CNAME	asia.cloudefy.in	-	-	300	asia

Fig 8- creating record sets

4.3 Creation of regional load balancer – this load balancer is based on round robin algorithms which balance the traffic between different availability zones in a single region. The instances are set behind this load balancer. A no of secondary load balancer can be created. It can't balance load between multiple service regions. Load balancing is done according to Round Robin algorithm. Load balancer is create using the Elastic load balancing service, selecting the launch load balancer under this we choose the load balancer id and the region in which it is being configured., in proposed work we have created two load balancer one each for US & ASIA region as follow

i. define and configure load balancer- in this step the load balance protocol and load balancer ID is configured the load balancer protocol is the protocol on which the web traffic will come in configuration health check for instances is created. In which the ping

protocol, path and port is configured .we have set the ping protocol to the HTTP , port 80 and ping path is index.html load balancer ping the instances in each health check interval which is configured 10 second in this project. Healthy and unhealthy threshold is configured in advance settings. These ratios define the no of unsuccessful/successful ping request to declare instance healthy or unhealthy.

The screenshot shows the configuration for a load balancer named 'singaporelb'. The 'Create LB Inside:' dropdown is set to 'My Default VPC (172.31.0.0/16)'. Under 'Listener Configuration', the 'Load Balancer Protocol' and 'Instance Protocol' are both set to 'HTTP', and the 'Load Balancer Port' and 'Instance Port' are both set to '80'. The 'Ping Protocol' is 'HTTP', 'Ping Port' is '80', and 'Ping Path' is '/index.html'. Under 'Advanced Details', the 'Response Timeout' is 5 seconds, 'Health Check Interval' is 10 seconds, 'Unhealthy Threshold' is 2, and 'Healthy Threshold' is 10.

Fig 9 – defining & configuring of load balancer

iii. Adding EC2 instances and configuration of security group –here the instances is added behind the load balancer one more benefits of AWS is that it does not expose instances directly to user but user communicate thorough the load balancer. Configuration of security group is same as above in 6.2. Final review is done before launching the load balancer.

Instance	Name	State	Security Groups	Zone	Subnet ID	Subnet CIDR
	i-b03e8e98	running	gopal_sec	ap-southe...	subnet-78558710	172.31.0.0/20
	i-b13e8e99	running	gopal_sec	ap-southe...	subnet-78558710	172.31.0.0/20

Define Load Balancer	Configure Health Check	Add EC2 Instances	VPC Information	Security Groups
Load Balancer name: singaporelb Scheme: internet-facing Port Configuration: 80 (HTTP) forwarding to 80 (HTTP)	Ping Target: HTTP:80/index.html Timeout: 5 seconds Interval: 10 seconds Unhealthy Threshold: 2 Healthy Threshold: 10	Cross-Zone Load Balancing: Enabled Connection Draining: Enabled, 30 seconds Instances: i-b03e8e98, i-b13e8e99	VPC: vpc-6655870e Subnets: subnet-78558710, subnet-6755870f	Security Groups: sg-d0bf56b8

Fig10- adding instances and final review

4. 5 Implementation of auto scaling

Amazon web service provides the facility to accommodate the dynamic change in the system. This is done by Auto scaling group. Auto scaling especially need for the

application on which no of request is variable per hour per day. Sometime peak load and some time completely free. Auto scaling groups defined as. Auto scaling is implemented as follow.

- i. **Creation of launch configuration** – launch configuration is same as the launching a instances the operating system and then security group is configured in the launch configuration
- ii. **Creation of auto scaling group** –Auto scaling group is created after configuring the launching configuration auto scaling group consist following attributes
 - I) First he AMI is created for the scaling group as the new initialized instances must have same configuration as other instances in the group.
 - II) Now the maximum and minimum size of scaling group is defined by the client. Initial group size also defined here in the show picture we have created a scaling group named **_auto** and set the initial group size to the two . Added the availability zone.

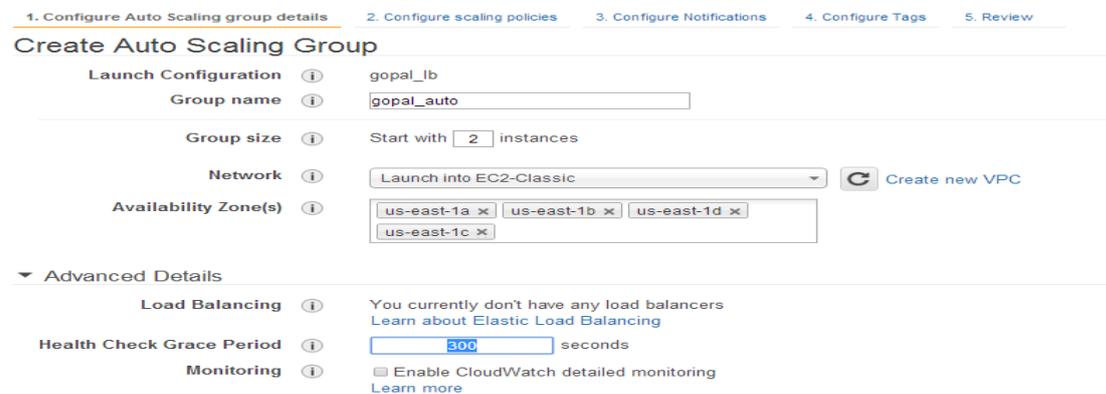


Fig11- auto scaling group initialization

iii. **Creation of auto scaling policy** – policies are set of conditioned and associate actions Auto scaling properties is created on the basic of metric. These can be CPU utilization; disk read or writes up, network traffic, request count. Alarm is configuring for specific metric. Cloud watch observe each metric and rise alarm. And auto scaling group will perform specific action. Load balancer gets informed automatically to send or stop sending request to the newly created or terminated instances. In the project picture we have created the policy for decrease and increase the group size based on CPU utilization and also defined the appropriate action.

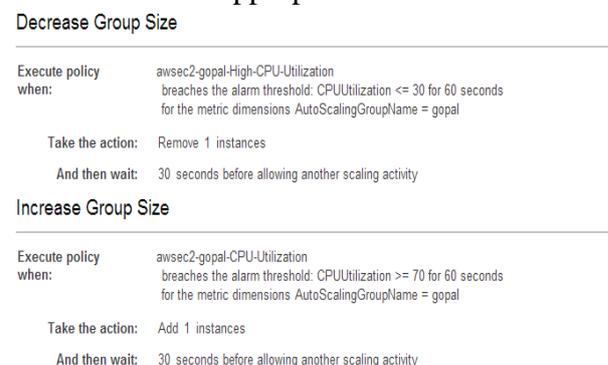


Fig 12- scaling policies to handle load

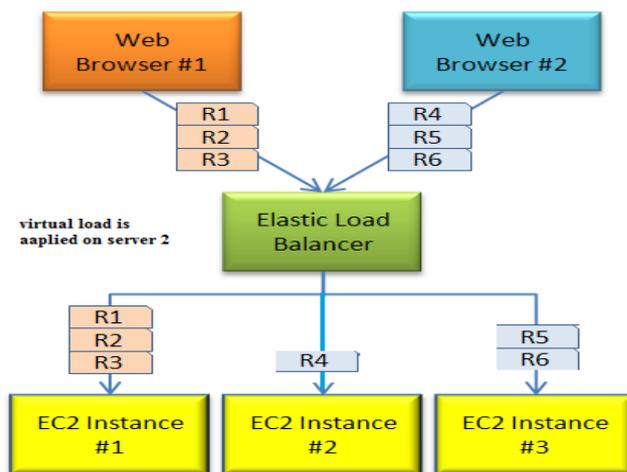
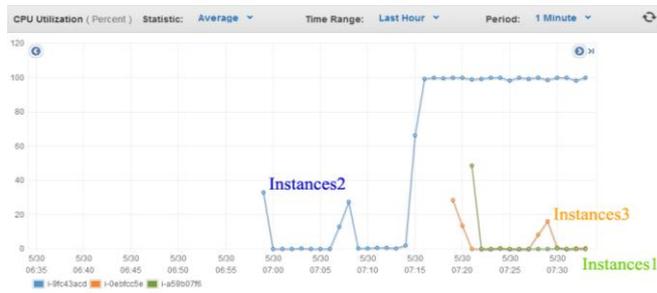
4.6 Resource monitoring -to provide the efficient solution of load balancing issue. System must have a reliable and correct monitoring tool by which admin can monitor each and every component. Amazon provides the cloud watch exclusively for monitoring the cloud. It provides the cloud watch as monitoring tool which automatically monitors load balancer and instances for matrix for example latency and no of request. It provides the detailed information in graph form as per user selected time frame. User can select different parameter and matrix to control the system. In this proposed work we are using CPU utilization watch, memory watch, network pattern .it also provide a comparison between different graphs. Instances health monitoring is done automatically in cloud watch. Best part of this service is notified the admin for specific condition and able to execute user defined actions. The following picture is monitoring graph for an scaling group instance which is showing the maximum CPU utilization for instance i-9fc43acd. If we do detailed study of this graph them we will get to know that initial when load is not applied (6.5) maximum CPU utilization was become zero as the load is applied on the instances is gone over loaded .auto scaling action is performed (part4.5)



Fig – 13 auto scaling monitoring

Results

- We have searched www.cloudefy.in from the different geographical area with the help of proxy server and main load balancer routed us to nearest hosting service as shown in fig this resolve our first issue of latency based routing latency based routing forward these request to regional load balancers to process the request, *us.cloudefy.in* & *asia.cloudefy.in* representing the regional load balancer (step 2).
- At the regional load balancer the load balancer distributed the load in round robbing fashion. As shown in fig. Here in the figure requested is generated randomly and thrown on the load balancer. some virtual load is also applied on the instance 2 as we can see from the picture load is distributed among the instances thus it sole our second proposed issue of load balancing in EC2 the load graph between instances is shown in following fig



- Auto scaling result is collected from the summary of auto scaling group activity in the cloud watch. Load pattern and the policies is already explained in 4.5. These results are according to the load pattern shown in step5. In starting as we defined the initial group size was 2 instances. But we also define that if maximum CPU utilizations less than 30% terminate one instance this is shown in the 4th line from bottom of figure. When we applied the load the auto scaling system automatically launched the new instances (5th and 6th line). Latter when load was removed auto scaling system terminated the newly created instances. (1st and 2nd line). Failed is system error of cloud network.

7 Conclusion

The current work aims to provide detailed knowledge of the importance of load balancing, auto scaling, resource monitoring and latency based load balancing for a cloud environment. In this research we used the Amazon cloud environment to develop a load efficient model if all the services are used individually. It will not be effective but if used together then an efficient load balancing. Auto scaling in the cloud depends on their uses. Auto scaling can be achieved in different ways on different cloud platforms. If we compare the services provided by different cloud service providers, Amazon Web Services is more reliable and cost efficient. Load balancing is a very challenging issue and needs to divide the load among the instances in a distributive manner. On this paper, a model using cloud services to provide the best solution to the load balancing issue. The following image shows the

7.2 Future work

Load balancing is the key issue in a cloud network. We have proposed a dynamic system to balance the load, but there is a need for lots of work to be done to improve the efficiency of the system. In the literature survey we have discussed different techniques for load handling

and balancing and after analyzing the proposed model we can say that first the monitoring system must be more frequent and the regional load balancer must be load predictive to balance the load between the instances. It will help the system to apply the changes according to the predictive load forecasting.

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Study of Key Barriers to Digital Payment Mode

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Abstract

The most recent decade has seen huge development being used of web and cell phone in India. Expanding utilization of web, portable entrance and government activity, for example, Digital India are going about as impetus which prompts exponential development being used of digital payment. Gadgets Consumer exchange made at purpose of offer (POS) for administrations and items either through web managing an account or portable saving money utilizing advanced mobile phone or card payment are called as digital payment. The organized survey was utilized as research device for understanding buyer impression of digital payment. Essential information was gathered from 400 respondents in Bengaluru. This Paper we are endeavoring to comprehend the key hindrances to digital payments as seen by the shoppers

Keywords: *Cashless Transactions Consumer Perception; Digital Payment; Digital Wallets*

Introduction

It has been said that each interruption makes openings and one such disturbance was the declaration of demonetization by Prime Minister Mr. Narendra Modi on 08 November 2016. Demonetization made colossal development open door for digital payment in India and the digital wallet organizations garbed the open doors with both the hands to extend their piece of the pie. Demonetization has exhibited a one of a kind stage for selection of digital payment, as a choice to money for Indian buyers.

Selection of cashless exchange has been fundamentally pushed by Prime Minister Mr. Narendra Modi as a component of government changes after demonetization of high esteem cash of Rs. 500 and 1000 (86% of money course). The demonetization brought about remarkable development in digital payment. By February this year, digital wallet organizations had demonstrated a development of 271 percent for an aggregate estimation of US\$2.8 billion (Rs. 191 crores) [1], Indian government and private part organizations, for example, Paytm, Freecharge and Mobikwik had been forcefully pushing a few digital payment applications, including the Aadhaar Payment application, the UPI application, and the National Payments Corporation of India (NPCI) built up the Bharat Interface for Money (BHIM) application. Digital exchanges utilizing applications has brought social change and aided in the selection of digital payment. This has brought about simplicity of move of cash in rustic territories which was not contacted before by the digital payment technique. Presently numerous remote speculators need to put resources into digital payment industry which is new appealing goals in light of extent of huge development in India.

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There are number of facilitators which are prompting the development of digital payment and change from money economy to less money economy. These facilitators incorporate infiltration of web network on advanced mobile phones, non-saving money monetary organization encouraging digital payment, one touch payment, ascent of budgetary innovation area and push by government either by giving impetuses or tax reductions. These all components are making positive environment for development of digital payment in India.

Digital Payment Modes in India

There are a few methods of digital payment accessible in India. These are:

On the web or portable wallets: They are utilized by means of the web and through cell phone applications. Cash can be put away on the application by means of revive by charge or Visas or net-keeping money. Purchaser wallet limit is Rs. 20,000 every month and the vendor wallet limit is Rs. 50,000 every month after self-assertion and Rs. 100,000 after KYC check.

Prepaid charge cards: Pre-stacked to person's financial balance. It is like a gift voucher; clients can make buys utilizing reserves accessible on the card - and not on acquired credit from the bank. Can be revived like a cell phone energize, up to an endorsed limit.

Charge/RuPay cards: These are connected to a person's financial balance. Can be utilized at shops, ATMs, online wallets, miniaturized scale ATMs, and for internet business buys. Platinum cards have overwhelmed Mastercards in India. The quantity of check cards in December 2015 expanded to 630 million contrasted with 22.75 in 2014.

AEPS: The Aadhaar Enabled Payment System utilizes the 12-digit remarkable Aadhaar distinguishing proof number to enable bank-to-bank exchanges at PoS. AEPS administrations incorporate parity enquiry, money withdrawal, money store, and Aadhaar to Aadhaar subsidize exchanges.

USSD: Stands for Unstructured Supplementary Service Data based versatile keeping money. It is connected to shipper's financial balance and utilized by means of cell phone on GSM arrange for payments up to Rs. 5,000 every day for each client.

UPI: The United Payments Interface (UPI) conceives being a framework that controls different ledgers onto a solitary portable application stage (of any partaking bank). Consolidations numerous saving money highlights, guarantees consistent reserve steering, and shipper payments. It encourages P2P support exchanges.

Digital payments in India have been encountering exponential development and with development of web and versatile entrance, in coming years the nation is prepared to observe a colossal surge in the reception of digital payments. As per Ratan Watal [2], chief counselor Niti Aayog and previous fund secretary, digital payments became 55% by volume and 24.2% by incentive in 2016-17 over the earlier year. Information from the Reserve Bank of India (RBI) demonstrates that the rate of selection of digital payments had quickened following demonetization a year ago however has hindered lately of 2017. Add up to digital exchanges in April 2017 of Rs109.58 trillion are 26.78 lower from Rs149.58 trillion in March 2017 [2].

The volume of digital exchange has seen exponential development in volume and esteem whether it is digital wallet, interbank exchange or exchange by charge or Mastercard. At shipper puts the quantity of card exchange at purpose of offer (PoS) terminal have seen an immense serge which mirrors that individuals have begun making payment by charge card as opposed to pulling back money from ATM to make payment. In January 2017 the

quantity of exchange of plastic expanded to one billion from 817 million in earlier year. It has been seen that ATM exchange are pretty much same at 700 million, the exchange at PoS terminal has expanded multiple times from 109million in January 2016 to 328 million in Jan 2017.

As indicated by Lokvir Kapoor, CEO at PineLabs "the card exchange post slander saw enormous development in light of foundation for the acknowledgment of card at various trader area." PineLabs has helped this development by sending a critical number of Pos at retailers the nation over. Additionally the quantity of activity, for example, money back, no exchange energize as far as possible with further help in development of digital exchanges. The administration put weight on banks to convey one million expansion Pos terminal in three months help the accessibility of PoS and by January 2017, their number rose to 2.52 million [3].

Literature Review

Bamasak [4] did ponder in Saudi Arabia found that there is a brilliant future for m-payment. Security of portable payment exchanges and the unapproved utilization of cell phones to make a payment were observed to be of incredible worries to the cell phone clients. Security and protection were the real worries for the shoppers which influence the appropriation of digital payment arrangements [5]. Doan [6] outlined the appropriation of portable wallet among buyers in Finland as just toward the starting phases of the Innovation-Decision Process.

Doing payments through cell phones has been being used for a long time and is currently set to detonate [7]. Likewise mobiles are progressively being utilized by customers for making payments. "Digital Wallet "has turned into a piece of buyers which are only advanced mobile phones which can work as cowhide wallets [6]. Digital wallet offered numerous advantages while exchanging cash, for example, comfort security and reasonableness [8]. Development in innovation has opened numerous methods of payments through which shoppers can do exchanges which are progressively helpful, available and satisfactory [9-11], buyers have a tendency towards versatile payment applications use [12]. Offering different advantages, for example, flexi payment digital wallet brands are giving additional comfort to purchasers [13]. Main consideration in reception of digital wallet is accommodation in purchasing items online without physically moving between various locations area [14]. There has been numerous investigations led in past on portable payment application to discover buyer premium and they discovered customer has positive tendency for the equivalent [12].

The elements, for example, saw usability, expressiveness and trust influence reception of digital wallet as payment technique. These components are named as facilitators and assumes urgent job in selection of digital payment arrangement [15]. Utilization of digital wallet among youth in the province of Punjab was observed to be related with societal impact and helpfulness, controllability and security, and requirement for execution upgrade. Premium valuing, multifaceted nature, an absence of minimum amount, and saw dangers are the obstructions to reception of digital payment frameworks [16].

An extensive model 'Payment Mode Influencing Consumer Purchase Model' was proposed by Braga and Mazzon. This model considered factors, for example, worldly introduction and partition, poise and torment of payment develops for digital wallet as another payment mode. Purchaser point of view of portable payments and versatile payment innovations are two most essential variables of portable payments inquire about [7]. Mallat [17]

contemplated shopper selection of portable payments in Finland. Concentrate found that versatile payment is dynamic and its appropriation relies upon absence of different payments strategies and certain situational factors.

Digital wallet payments convey additional accommodation to customers by offering adaptable payment options and quickening trades [13]. Shin and Ziderman [18] tried a far reaching model of purchaser acknowledgment with regards to portable payment. It utilized the brought together hypothesis of acknowledgment and utilization of innovation (UTAUT) demonstrate with develops of security, trust, social impact, and self-adequacy. The model affirmed the established job of innovation acknowledgment factors (i.e., saw to clients' frame of mind), the outcomes likewise demonstrated that clients' dispositions and expectations are affected by apparent security and trust. In the all-inclusive model, the directing impacts of socioeconomics on the relations among the factors were observed to be critical. Digital wallets offer the shoppers the comfort of payments without swiping their charge or Visas. Moment Cash accessibility and renders consistent portability is additionally an interesting element of these digital applications, for example the parity in your Paytm wallet can be effectively exchanged to your financial balance as and when you need. Following are some different focal points of making exchanges through e wallets:

Spares time: digital wallets hold the sum in the electronic shape in order to facilitate the payment procedure where clients can make online payments without entering any card subtleties.

Usability: As digital wallet resembles a single tick pay without filling insights regarding card viz card number and passwords inevitably, It enables client to connect digital wallet to records and pay immediately so the shoppers confront no issues to enter the subtleties each time an exchange occur.

Security: there is a decent measure of security when payments are made through e wallets since the wallet does not pass the payment card subtleties to the site. These virtual wallets enable clients to bolt their wallet.

Advantageous and data put away under one rooftop: As digital wallets dispenses with need to convey the physical wallet they are profoundly helpful. Likewise a superior administration is conceivable as there is synchronization of information from different stages like financial balances, credit and platinum cards, versatile records and charging entrances.

Appealing rebate: Cash back and limits are being offered by the greater part of the players alongside giving disconnected wallet balance top up known as 'Money Pickup' benefit. This administration is being offered by Mobikwik that will encourage money to be straightforwardly added to MobiKwik wallet where shoppers of significantly littler towns can be profited.

According to Ministry of Finance Report (December 2016) on Digital payment, monetary consideration is one of the preminent test confronting India. 53 percent of India populace approached formal monetary administrations. In this specific situation, digital payment can go about as quickening agent to money related consideration [19]. Expanding accessibility of cell phone, accessibility of information arrange framework, rollout of 3G and 4G systems and vast trader eco framework are the basic empowering agents of digital payment in India. It is additionally bolstered by the planned endeavors of industry, controller and government. According to RBI's report 'Vision 2018' four pronged technique concentrating on control,

strong foundation, powerful supervisory system and client centricity has been embraced to push appropriation of digital payment in India [19].

The level of money for exchanges has seen a quick decrease in the previous couple of years in India. In 2010, the level of money in all payments was 89% thought about with 78% in 2015. This quick decay is a consequence of an expanded reception of non-money instruments, for example, cards and digital payments, for example, versatile wallets, electronic exchanges, and so forth. Put away esteem instruments like versatile wallets (Paytm, Mobikwik, Citrus, and so forth.) and paid ahead of time and gift vouchers have made payments however web gadgets helpful and simple. India speaks to one of the biggest market open doors for digital payments. With a populace of 1.25 billion, India represents generally 18% of the worldwide populace. The two key drivers of digital payments-cell phones and web clients are as of now entrenched in India. To date, India has about 1.0 billion cell phone supporters and 300 million web clients, positioning second on the two measurements all around [20].

Objectives and Hypothesis

The objective of the study was to find out the consumer perception on Key Barriers to Digital Payment

Research Methodology

The current study is based on primary data collected from 400 respondents from the different parts of Bengaluru. A well-structured questionnaire was designed to collect the information from the respondents the questionnaire was designed to study perception of customer towards adoption of digital payment mode. Likert five point scales were used for obtaining responses. The responses have been collected by means of face-to-face interviews by authors.

Sampling Plan

Sampling unit: This call is for defining the target population to be surveyed. In this research the sampling unit was the customers who have been using the digital payment modes.

Sample size: In this survey the sample size decided was 400

Sampling procedure: We adopted Intercept interview method for collection of primary data, as it is not possible to take appointment from a large number of respondents. Purpose of this research was told to respondents and questions were explained to them in case there was any need for understanding any particular question. There had been no personal bias or distortions were allowed while recording the responses.

Research and Statistical Tools Employed

The research and statistical tools employed in this study are ANOVA and frequency analysis. SPSS 19 was used to perform statistical analysis. Cronbach's Alpha test was used to find the reliability of the data. Frequency analysis on the main factor under study, indicate overall satisfaction levels of respondents with digital payment mode. ANOVA was carried out to find the variance in the responses and to test the hypothesis.

Results and Discussion

Case Processing Summary			
		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.921	106

It can be observed that 106 Questions were analyzed and 400 respondent's opinions were put into reliability test, the coefficient of reliability was found to be 0.921, which is indicating a highly reliable questionnaire and there are no missing values.

KEY BARRIERS TO DIGITAL PAYMENTS					
	SA	A	N	D	RANK
CYBER CRIME	200	120	40	40	RANK 2
LITERACY REQUIRED	56	216	88	40	RANK 6
TRANSPARENCY & EFFICIENCY IN E - PAYMENTS	112	184	56	48	RANK 3
INCREASE IN INTERNET FRAUD	104	232	48	16	RANK 1
HABIT TO USE CASH	56	208	72	64	RANK 7
LACK OF COMPELLING VALUE PROPOSITION	120	152	88	40	RANK 4
INERTIA OF NON-CASH METHODS	80	144	112	64	RANK 9
INCENTIVES/ORDERS FROM OTHER METHODS	16	240	80	64	RANK 8
FRAUD/HIDDEN CHARGES	112	160	80	40	RANK 5

As per Respondents view it can be observed that following barriers in hierarchy are most significant as per views expressed by the respondents

- Increase in Internet Fraud
- Cyber Crime
- Transparency & Efficiency in E – Payments
- Lack of Compelling Value Proposition
- Fraud/Hidden Charges
- Literacy Required
- Habit to Use Cash
- Incentives/Orders from Other Methods
- Inertia of Non-Cash Methods

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Do you think Cashless transaction is more convenient than Cash transaction?	Between Groups	274.302	9	30.478	137.629	.000
	Within Groups	52.927	239	.221		
	Total	327.229	248			
How do you ensure that payment is received in case of Cashless Transaction?	Between Groups	338.009	9	37.557	220.518	.000
	Within Groups	40.875	240	.170		
	Total	378.884	249			
What are the challenges you face in the current economic situation-GST in particular?	Between Groups	209.101	9	23.233	168.181	.000
	Within Groups	33.155	240	.138		
	Total	242.256	249			
What is your expectation in new mode of payment especially through app based payment?	Between Groups	125.340	9	13.927	133.887	.000
	Within Groups	24.964	240	.104		
	Total	150.304	249			
What kind of help you expect from the government/ banks to tackle the current scenario?	Between Groups	5.427	9	.603	.667	.739
	Within Groups	217.073	240	.904		
	Total	222.500	249			
What is your Current Mode of Transactions adopted for Goods Purchase & Selling	Between Groups	47.484	9	5.276	1.838	.062
	Within Groups	688.772	240	2.870		
	Total	736.256	249			
Cyber Crime	Between Groups	14.243	9	1.583	1.694	.091
	Within Groups	224.157	240	.934		
	Total	238.400	249			
The literacy required / Complexity of using	Between Groups	23.709	9	2.634	3.511	.000
	Within Groups	180.087	240	.750		
	Total	203.796	249			
Transparency & Efficiency in E payments	Between Groups	2.720	9	.302	.420	.924
	Within Groups	172.516	240	.719		
	Total	175.236	249			
Increase in Internet fraud	Between Groups	45.501	9	5.056	7.768	.000
	Within Groups	156.195	240	.651		
	Total	201.696	249			
Habit to use Cash	Between Groups	6.524	9	.725	1.175	.312
	Within Groups	148.100	240	.617		
	Total	154.624	249			
Lack of compelling Value Proposition	Between Groups	1.728	9	.192	.269	.982
	Within Groups	171.156	240	.713		
	Total	172.884	249			
Inertia of Non Cash Methods	Between Groups	6.382	9	.709	.777	.638
	Within Groups	218.934	240	.912		
	Total	225.316	249			
Incentives / Orders from other Methods	Between Groups	7.045	9	.783	1.488	.153
	Within Groups	126.271	240	.526		
	Total	133.316	249			
Fraud / Hidden Charges	Between Groups	40.791	9	4.532	5.544	.000
	Within Groups	196.205	240	.818		
	Total	236.996	249			
Reach	Between Groups	5.230	9	.581	1.580	.122
	Within Groups	88.246	240	.368		
	Total	93.476	249			

To Understand the relationship between consumers attitude on Barriers to Digital payments	H0 : There exists no relationship between consumers attitude on Barriers to Digital payments						
	H3: There exists strong relationship between consumers attitude on Barriers to Digital payments						
	AnovaF-Test	F Critical	Level of Confidence	Sig.	Critical Value	STD. ERROR	Accept the Alternate Hypothesis
RESULT	25.46	2.394	95%	0.000	0.05	5%	YES

It can be observed that $F_{test} 25.46 > F_{critical} 2.394$, and Sig is < 0.05 which means there exists a strong relationship between key barriers and consumers attitude

Result: There exists strong relationship between consumers attitude on Barriers to Digital payments

Conclusion

For quite a long time, innovation has been a key empowering agent of advances crosswise over industry also, inside budgetary administrations. Changes in the payments scene are a direct result of innovation making new approaches to execute conceivable. In our present decade, digitisation is further moving payments from the physical domain to the virtual domain, for example, with versatile payment applications. While this move makes it less demanding and quicker to execute payments, it all the while uncovered some security dangers that have driven reactions, for example, tokenisation (the powerful anonymisation of card information). As we enter a period of exponential figuring power, the demonstration of making a payment is winding up additional consistent, even imperceptible, as the physical instruments for starting payments are subsumed into applications and other digital forms, for example, ride-sharing administrations.

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Effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th Grade Students through Multimedia and Traditional Instructional Strategies: An Experimental Study

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Pooja**

Abstract The present study was undertaken to investigate the effect of cognitive styles and achievement motivation on academic achievement of 9th grade students through multimedia and traditional instructional strategies. The study was carried out on 64 students (32 in the experimental group, 32 in control group) of 9th grade of Om Public School, Gohana, Dist. (Sonapat) selected by multi-stage sampling. The investigators used Group Embedded Figure Test by Witkin et al. (1971) to identify the cognitive styles; Achievement Motivation Scale by Deo and Mohan (2011) to test Achievement Motivation; Multimedia Instructional Package was developed by investigators; and an Achievement test in English was also developed by investigators. Levene's Test for Homogeneity of variance was implemented to test the homogeneity of the data obtained and was further analyzed by using ANOVA with 2×2 factorial design. Findings of the study revealed that the main effects of cognitive styles, achievement motivation on academic achievement were significant. A significant interaction effect of cognitive styles and achievement motivation on academic achievement of students was found.

Key words: Cognitive Styles, Achievement Motivation, Multimedia and Traditional Instructional Strategies, Academic Achievement

Introduction

In this rapidly changing world and with the growing advancement in science and information technology, the place of education has become so vital that every parent today sets high goals to educate his/her child. It is a common observation that success in the academic achievement saves as an emotional tonic and any damage done to a child may be partially repaired by the success in school. Sound development in academic can be matched with pillars on which entire future structure of personality stands and a good academic record of students is an index of an effective educational system. In more general term, academic achievement means the achievement of the pupils in so-called academic subjects. Therefore, academic achievement may be defined as a measure of knowledge, understanding or skills in a specific subject or a group of subjects. Differences in academic achievement cannot be attributed to one single factor but to a large number of factors those affect academic achievement. The factors on which achievement depends are innumerable e.g. intelligence, creativity, cognitive style, achievement motivation, instructional strategy, personality etc. However, it was not possible to take them up all these factors one time due

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to constraints of time and resources, cognitive style, achievement motivation and instructional strategy were selected for the present study.

Cognitive styles refer to stable patterns of individual responsiveness, pervading areas of human functioning such as perception and cognition. In other words, cognitive styles refer to how information is received and organized. This is a new topic in light of research on how information from the environment is received and organized. The results of various studies indicated that individuals have different approaches in dealing with one single task. However, these differences do not reflect their intelligence or specific abilities. These differences deal with individuals; preferences for information processing and organization and reaction to environmental stimuli (Noroozi, 2003). For instance, some people have quick reactions in most circumstances, while others are reflective and react slowly, although these two groups of individuals may have similar knowledge with regard to a particular task. Defined as modes of information processing, cognitive styles are not simply habits in the technical sense of learning theory, for they are not directly responsive to the principles of acquisition and extinction. They develop slowly and do not appear to be easily modified by specific training. Research reveals that Cognitive Styles exhibit stability and persuasiveness across diverse spheres of behaviour that, though entail generalized habits of information processing, they are intimately interwoven with affective, temperamental and motivational structures as a part of one's total personality, a manifestation of one's core personality structures in cognition that are generally known as Cognitive Style. Cognitive Styles are important to be considered as input variables that might moderate the operation and effectiveness of educational/training programmes or interact with programmes or components to produce differential results. Each of an individual cognitive dimension has been found to correlate with certain intellectual tasks and the ability to learn and perform in school. A number of cognitive styles have been identified and studied over the years. Field independence versus field dependence is probably the most well known style. It refers to a tendency to approach the environment in an analytical, as opposed to global, fashion. At a perceptual level, field independent personalities are able to distinguish figures as discrete from their backgrounds, compared to field dependent individuals who experience events in an undifferentiated way. In addition, "field dependent individuals have a greater social orientation relative to field independent personalities. Studies have identified a number connection between this cognitive style and learning" (Messick, 1976). For example, field independent individuals are likely to learn more effectively under conditions of intrinsic motivation (e.g., self-study) and are influenced less by social reinforcement. Researches in the field of Cognitive Styles have shown Cognitive Styles as a main factor have significant effect on Achievement. It is evidenced by the research conclusions of the studies conducted by Suet (2009), Linder (2011) Nicolaou and Xistouri (2011) and Wei and Sazilah (2012) which showed positive and significant correlation of Cognitive Styles on Achievement. In controvertion results of the studies conducted by Altun and Cakan (2006) and Ipek (2010) did not find significant relation of Cognitive Styles with Achievement.

Another variable considered significant for the present study pertains to Achievement Motivation of students. Achievement Motivation is the attitude to achieve rather than the achievements themselves. It can be considered as extended person- intrinsic motivation because its reinforcement is delayed. It arises from an interaction within the person. Achievement motivation is "a pattern of planning of actions and of feelings connected with

striving to achieve some internalized standard of excellence, as contrasted for example, will power or friendship” As academic achievement is not a function of cognitive variable alone the emphatic stress on the contribution of the psychological variable is imperative. As such which of the psychological variable is of prime importance, what percentage of proportion variance is attributable by them towards the criteria, needs elaboration and quantification? Research studies of Mahyuddin et al. (2009), Rais Hasan et al. (2012) and Chow and Yong (2013) showed positive and significant correlation between achievement motivation and achievement. However, researchers like Bhatt (2009) and Onete (2012) could not find significant relationship of achievement motivation on Students' Achievement.

Instructional Strategies are subsets of methods of instruction. These strategies help to activate students' curiosity about a class topic, to engage students in learning, to probe critical thinking skills, to keep them on task, to engender sustained and useful classroom interaction, and, in general, to enable and enhance their learning of the course content. Teacher's concern about the selection of instructional strategies influences the effectiveness, efficacy and appeal of instruction. Multimedia in Education has been extremely effective in teaching individuals a wide range of subjects. Multimedia instructional strategy enables students to represent information using several different media. Some students learn by interpreting text, while others require more graphical or aural representations, allows for self-pacing and discovery. Thus a multi-sensory experience can be created for the audience, which in turn, elicits positive attitudes towards its application (Neo and Neo, 2000). Multimedia instruction has also been shown to elicit the highest rate of information retention and result in shorter learning time (Ng and Komiya, 2000). Thus Student's exposure to such strategies results in better teaching-learning as compared to traditional method. With multimedia, the process of learning becomes more goal oriented, more participatory, flexible in time and space, unaffected by distances and tailored to individual learning styles, and increased collaboration between teachers and students (Sharma & Madan, M. 2018). Multimedia makes learning friendly and fun-oriented without fear of inadequacies or failure. In other words, users of multimedia applications have an opportunity to read about information, and to see it, hear it, and watch it move (Sharma & Kiran, 2016). Apparently, the features of multimedia environments allow learners to explore, discover, ponder, search, question, answer and receive feedback (Brett, 1998). Earlier researches done in the field of multimedia instructional strategy have revealed multimedia as a main factor having significant effect on achievement. Studies by Gill et al. (2008), McNeill et al. (2009), Stanwick (2010), Sharma and Kakkar (2010) Rolfe and Gray (2011), Samur (2012), Maree (2013), Rusanganwa (2013) Sharma & Pooja (2016), Sharma & Priyamvada (2017) showed significant effect of multimedia instruction on achievement.

The variable wise rationale of the problem leaves wide scope for investigating the combined impact of independent variables on dependent variable in different combinations in a factorial frame of reference. It may be concluded that that the variables of Cognitive Styles, Achievement Motivation and Instructional Strategy are interrelated factors and if investigated together in the light of academic achievement of students, the study may throw better light on the individual and combined impact of these variables which may be used effectively for the educational significance by its users.

Objectives of the Study

1. To compare the Academic Achievement of Field Independent and Field Dependent groups of 9th Grade students before experimental treatment.
2. To compare the Academic Achievement of High and Low Achievement Motivation groups of 9th Grade students before experimental treatment.
3. To compare the Academic Achievement of Experimental and Control groups of 9th Grade students before experimental treatment.
4. To study the effect of Cognitive Styles on Academic Achievement of 9th Grade students after experimental treatment.
5. To study the effect of Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment.
6. To study the interaction effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment.

Hypotheses of the Study

- H₀₁ There exists no significant difference in Academic Achievement of Field Independent and Field Dependent groups of 9th Grade students before experimental treatment.
- H₀₂ There exists no significant difference in Academic Achievement of High and Low Achievement Motivation groups of 9th Grade students before experimental treatment.
- H₀₃ There exists no significant difference in Academic Achievement of Experimental and Control groups of 9th Grade students before experimental treatment.
- H₀₄ There exists no significant effect of Cognitive styles on Academic Achievement of 9th Grade students after experimental treatment.
- H₀₅ There exists no significant effect of Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment.
- H₀₆ There exists no significant effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment.

Research Design and Methodology

- (i) **Design-** Factorial design (2×2) was selected to measure main and interaction effect of independent variables on the dependent variable.
- (ii) **Variables-** Cognitive Styles (Field Independent & Field Dependent), Achievement Motivation (High Achievement Motivation and Low Achievement Motivation and Instructional Strategies (Multimedia Instructional Strategy & Traditional Instructional Strategy) were taken as independent variables and Academic Achievement was taken as dependent variable.
- (iii) **Method-** Experimental Method was used.
- (iv) **Sample-** The sample of the study was selected through multi-stage sampling. At the first stage, all the students studying in 9th class of Om Public School, Gohana were selected. At the second stage, the tool of Cognitive Style was administered to the students and two groups belonging to field independent and field dependent categories were formulated. (Students who scored above 8 were considered to be field independent and students who scored 8 or less than 8 were considered to be field dependent). At the third stage, the tool of Achievement Motivation was administered and two groups (High Achievement Motivation and Low Achievement Motivation) were formulated in accordance with Kelly's (1939)

consideration of taking up Top and Bottom 27% groups. Then on the basis of randomization two groups were formed i.e. experimental group and control group. Experimental group consisted of 32 students control group also consisted of 32 students

(v) **Research Instruments-** In the present study following tools were used for data collection:

- 1) Group Embedded Figure Test (GEFT) by Witkin et al. (1971) to identify the Cognitive Style
- 2) Achievement Motivation (n- Ach) Scale by (Deo and Mohan, 2011) to test Achievement Motivation
- 3) Multimedia Instructional Package (Developed by the Investigator)
- 4) Achievement Test in English (Developed by the Investigator)

(v) **Procedure for Data collection-** The research instruments were administered on the subjects personally by the researcher herself. The respondents were informed that the information given by them would be kept confidential and would be used for research purpose only. They were asked to follow the instructions. The sheets were collected back on the spot.

(vi) **Statistical Techniques-**

- Descriptive statistics like Mean, Standard Deviation and Standard Error of Mean were used to analyze and describe the characteristics and nature of sample or data.
- 't' test was used to compare the groups and to arrive at findings and conclusions.
- Two Way Analysis of Variance (ANOVA) with 2x2 Factorial Design was employed to study the main effect and interaction effect of independent variables on dependent variable. Wherever F-ratios were found to be significant, t-ratios were computed to find out the significance of difference. To test the assumption of homogeneity of variance before applying Two Way ANOVA, the Levene's Test for Homogeneity of Variance was used.

Analysis and Interpretation

The analysis comprised four-folds as discussed under an equal number of sections, The first section (1) makes comparison of academic achievement of Field Independent and Field Dependent groups of 9th grade students (before experimental treatment); the second (2) of academic achievement of High and Low Achievement Motivation groups of students (before experimental treatment); the third (3) of academic achievement of experimental and control groups of students (before experimental treatment); the fourth (4) analyze the effect of Cognitive Styles and Achievement Motivation on academic achievement of students (after experimental treatment).

Section 1

Comparison of Academic Achievement of Field Independent and Field Dependent Groups of 9th Grade Students (Before Experimental Treatment)

This section compares the achievement scores of field independent and field dependent groups of 9th grade students before experimental treatment as shown in table 1

Table 1: Mean, S.D. and 't' value of Academic Achievement of Field Independent and Field Dependent Groups

	Cognitive Styles	N	Mean	Std. Deviation	SEM	't' value
Pre-test	Field Independent	32	30.12	1.60	.28	1.518 ^{NS}
	Field Dependent	32	29.25	2.83	.50	

NS= Not Significant

Mean scores of academic achievement of 9th grade students having field independent and field dependent type of cognitive styles before experimental treatment were 30.12 and 29.25; besides S.D. 1.60 and 2.83 respectively; and 't' value 1.518, which is not significant at any level, indicating that, there exists no significant difference in academic achievement of field independent and field dependent groups of students. Thus, the hypothesis H₀₁, "There exists no significant difference in Academic Achievement of Field Independent and Field Dependent groups of 9th Grade students before experimental treatment" is retained. Mean score of field independent group (30.12), slightly higher than that of field dependent group (29.25), too, indicates that the two groups do not differ significantly, showing that both the groups had almost same type of academic achievement before the experimental treatment.

Section 2

Comparison of Academic Achievement of High and Low Achievement Motivation Groups Of 9th Grade Students (Before Experimental Treatment)

Comparison of achievement scores of sample students having high achievement motivation and low achievement motivation is given in table 2.

TABLE 2: Mean, S.D. and 't' value of Academic Achievement of High and Low Achievement Motivation Groups

	Achievement Motivation	N	Mean	Std. Deviation	SEM	't' value
Pre-test	High Achievement Motivation	32	29.90	1.27	.22	0.749 ^{NS}
	Low Achievement Motivation	32	29.46	3.04	.53	

NS= Not Significant

Mean scores of academic achievement of sample students having high achievement motivation and low achievement motivation before experimental treatment were 29.90 and 29.46; their S.D. 1.27 and 3.04 respectively; and 't' value for the two groups, 0.749, which is not significant at any level, indicating that there exists no significant difference in academic achievement of students with high achievement motivation and low achievement motivation. Thus, the hypothesis H₀₂, "There exists no significant difference in Academic Achievement of High and Low Achievement Motivation groups of 9th Grade students before experimental treatment" is retained. Mean score of high achievement motivation group (29.90), being slightly higher than that of low achievement motivation group (29.46), too do not differ significantly, meaning there by that both group had almost same type of academic achievement before experimental treatment.

Section 3

Comparison of Academic Achievement of Experimental and Control Groups Of 9th Grade Students (Before Experimental Treatment)

Comparison of achievement scores of students of experimental and control groups is given in table 3.

TABLE 3: Mean, S.D. and 't' value of Academic Achievement of Experimental and Control groups

	Groups	N	Mean	Std. Deviation	SEM	't' value
Pre-test	Experimental group	32	30.25	1.75	.31	1.926 ^{NS}
	Control group	32	29.12	2.69	.47	

NS= Not Significant

Mean scores of academic achievement of students of experimental and control group before experimental treatment were 30.25 and 29.12; with S.D. 1.75 and 2.69 respectively, and 't' value between two groups 1.926, which is not significant at any level, indicating that there exists no significant difference in academic achievement of experimental and control groups of students before experimental treatment. Thus, the hypothesis H₀₃, "There exists no significant difference in Academic Achievement of Experimental and Control groups of 9th Grade students before experimental treatment" is retained. Mean score of students of experimental group (30.25) is slightly higher than the students of control group (29.12), also indicates that they do not differ significantly, that is both the groups had almost same type of academic achievement before experimental treatment.

Section 4

Effect of Cognitive Styles and Achievement Motivation on Academic Achievement Of 9th Grade Students (After Experimental Treatment)

This section explores the effect of cognitive styles and achievement motivation on academic achievement of sample students, based on Levene's test for Homogeneity of variances or Levene's test of equality of variances and on Two way ANOVA for 2×2 factorial design to assess the interaction effect of cognitive styles and achievement motivation on academic achievement of students.

4.1. Levene's Test for Homogeneity of Variances

Levene's test of equality of variance tests the assumption of homogeneity of variance whereas Two way ANOVA is quite sensitive to heterogeneity of variance. Table 4 to 9 and respective figures 1 to 4 explain the scenario of significant differences, if any, among the experimental and control groups on various dimensions tested in this section.

Table – 4: Levene's Test for Homogeneity of variance

F	df₁	df₂	Sig.
2.103	3	60	0.058

Table 4 shows F_{Levene} to be 2.103 with degrees of freedom 3 and 60 ($p= 0.058$) which does not fall in the critical region, indicating thereby that the variance between groups is homogenous, i.e., groups are assumed to have similar or equal variance.

4.2 ANOVA For 2×2 Factorial Design for academic achievement of 9th grade students in relation to cognitive styles and achievement motivation

In order to study the main and interaction effect of cognitive styles and achievement motivation on academic achievement of students, data was subjected to analysis of variance, on (2×2) factorial design as in figure 1, presenting the first independent variable i.e. cognitive style coded as (A) in terms of two styles – Field Independent (A₁) and Field Dependent (A₂); and the second independent variable i.e. achievement motivation coded as (B) along two levels – high achievement motivation (B₁) and low achievement motivation (B₂). Table 5 and 6 respectively present Means and S.D.'s of the sample groups; and the Summary of ANOVA (2×2) analysis in terms of main effect and interaction effect.

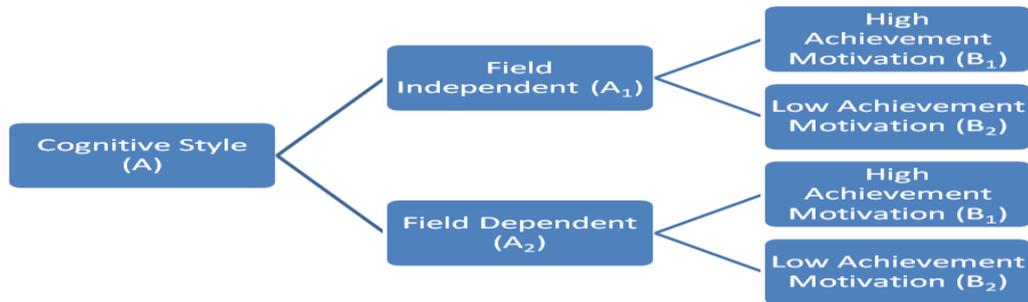


Figure 1: Schematic Layout of 2x2 Factorial Design for Effect of Cognitive Styles and Achievement motivation on Academic Achievement

Table 5: Mean and S.D. of samples of 2x2 Design for Cognitive Styles and Achievement Motivation

Cognitive Styles (A)	Achievement Motivation (B)	N	Mean	S.D.
Field Independent (A ₁)	High Achievement Motivation (B ₁)	16	53.87	5.26
	Low Achievement Motivation (B ₂)	16	43.06	6.67
Field Dependent (A ₂)	High Achievement Motivation (B ₁)	16	41.50	6.78
	Low Achievement Motivation (B ₂)	16	42.31	13.01

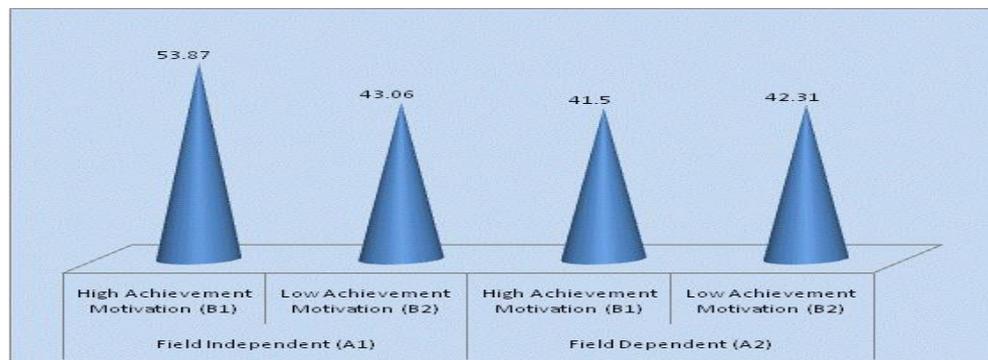


Figure 2: Mean Scores for Interaction Effect of Cognitive Styles and Achievement Motivation on Academic Achievement

Table 6: Summary of Two way ANOVA (2x2 Factorial Design) for Academic Achievement of Students with respect to Cognitive Styles and Achievement Motivation

Source of Variance	Df	Sum of Squares (SS)	Mean sum of squares (MS)	f-value
Cognitive Styles (A)	1	689.063	689.063	9.583**
Achievement Motivation (B)	1	400.000	400.000	5.563*
Cognitive Style (A) × Achievement Motivation (B)	1	540.563	540.563	7.518**
Between Cells	3	1629.625		
Within Cells	60	4314.125	71.902	
Total	63	5943.750		

** Significant at 0.01 level; *Significant at 0.05 level

4.3 Main Effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th Grade Students.

Cognitive Styles (A)

Table – 6, shows that F- value (9.583) for main effect of cognitive styles on academic achievement is significant at 0.01 level meaning thereby that cognitive styles have significant effect on academic achievement of students. Therefore the null hypothesis H_{04} , “There exists no significant effect of Cognitive styles on Academic Achievement of 9th Grade students after experimental treatment” is rejected. So also do the ‘t’ value of 2.851, being significant at 0.01 level.

TABLE 7: Mean, S.D. and ‘t’ value of Academic Achievement of Field Independent and Field Dependent Groups

	Cognitive Styles	N	Mean	Std. Deviation	SEM	‘t’ value
Post Test	Field Independent	32	48.46	8.07	1.42	2.851**
	Field Dependent	32	41.90	10.21	1.80	

** Significant at 0.01 level

Table 7 further confirms that Mean scores of academic achievement of students along field independent and field dependent type of cognitive styles after experimental treatment was found to be 48.46 much higher in favour of the experimental group and 41.90 in favour of the control group, indicating a significant difference between the two groups. Their S.D.’s 8.07 and 10.21 respectively, as well as ‘t’ 2.851, indicate a significant difference at 0.01 level of significance, conforming further that, there exists a significant difference in academic achievement of field independent and field dependent group of students.

Achievement Motivation (B)

Table 6 showed F- value (5.563) for main effect of achievement motivation on academic achievement of sample students, which is significant at 0.05 level indicating that achievement motivation has a significant effect on these students’ academic achievement. Therefore the null hypothesis H_{05} , “There exists no significant effect of Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment” is rejected. Further, ‘t’-value 2.115 as computed in Table – 8 indicates a significant difference at 0.05 level on achievement motivation of high achievement motivation and low achievement motivation students.

TABLE 8: Mean, S.D. and ‘t’ values of Academic Achievement of High and Low Achievement Motivation Groups

	Achievement Motivation	N	Mean	Std. Deviation	SEM	‘t’ value
Post-test	High Achievement Motivation	32	47.68	8.67	1.53	2.115*
	Low Achievement Motivation	32	42.68	10.18	1.79	

* Significant at 0.05 level

Table 8 also shows that the mean scores of academic achievement of students having high achievement motivation and low achievement motivation after experimental treatment are 47.68 and 42.68 respectively, higher in favour of the experimental group than that of the control group, indicate a significant difference between the two groups. They also differ with S.D.’s 8.67 and 10.18 respectively. Clearly, there exists a significant difference in academic achievement of students with high achievement motivation and low achievement motivation. It proved that high achievement motivation students had better academic achievement in comparison to students having low achievement motivation.

4.4 Interaction Effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th grade Students

Cognitive Styles (A) × Achievement Motivation (B)

Table 6 indicated F-value (7.518) between cognitive styles and achievement motivation which is significant at 0.01 level meaning thereby that Cognitive Styles and achievement motivation interact with each other. Therefore, the null hypothesis H₀₆, “There exists no significant effect of Cognitive Styles and Achievement Motivation on Academic Achievement of 9th Grade students after experimental treatment” stands rejected, which implies that interaction effect exists quite significantly, that is, the variables of cognitive styles and achievement motivation do leave an interaction effect on academic achievement. More so, ‘t’- test employed to find out the significance of difference in mean scores of Academic Achievement of different groups, as presented in Table 9, and illustrated graphically in Figure 8.

Table – 9: ‘t’- values for Mean Achievement Scores of Different groups of Cognitive Styles (A) × Achievement Motivation (B)

Groups	N	Mean	Std. Deviation	Std. Error Mean	‘t’ value
A ₁ B ₁ vs. A ₁ B ₂	16	53.87	5.26	1.31	5.086**
	16	43.06	6.67	1.66	
A ₁ B ₁ vs. A ₂ B ₁	16	53.87	5.26	1.31	5.765**
	16	41.50	6.78	1.69	
A ₁ B ₁ vs. A ₂ B ₂	16	53.87	5.26	1.31	3.295**
	16	42.31	13.01	3.25	
A ₁ B ₂ vs. A ₂ B ₁	16	43.06	6.67	1.66	.657 ^{NS}
	16	41.50	6.78	1.69	
A ₁ B ₂ vs. A ₂ B ₂	16	43.06	6.67	1.66	.205 ^{NS}
	16	42.31	13.01	3.25	
A ₂ B ₁ vs. A ₂ B ₂	16	41.50	6.78	1.69	.221 ^{NS}
	16	42.31	13.01	3.25	

**** Significant at 0.01 level; * Significant at 0.05 level; NS - Not significant**
 A₁B₁ = Field Independent High Achievement Motivation; A₁B₂ = Field Independent Low Achievement Motivation;
 A₂B₁ = Field Dependent High Achievement Motivation; A₂B₂ = Field Dependent Low Achievement Motivation;

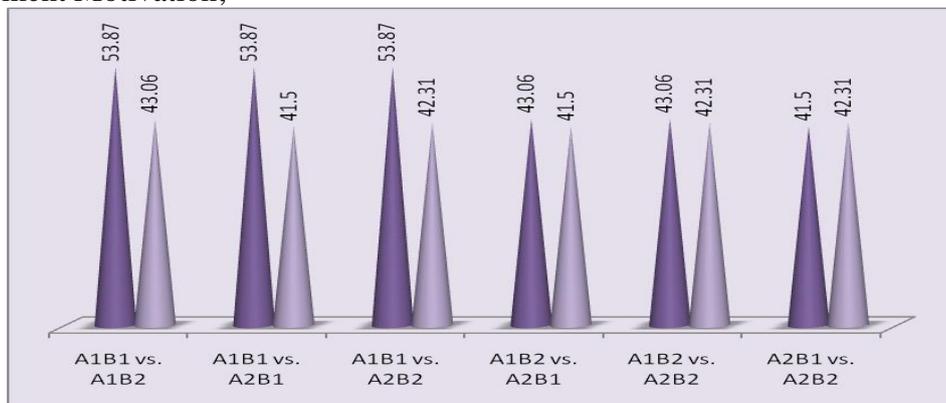


Figure 3: Mean Achievement Scores of Different groups of Cognitive Styles (A) × Achievement Motivation (B)

Table 9 indicates that the mean scores for field independent students having high achievement motivation (A_1B_1) and for field independent students having low achievement motivation (A_1B_2) differ significantly; meaning thereby that field independent students having high achievement motivation (A_1B_1) have significantly higher Academic Achievement than the field independent (A_1B_2) students having low achievement motivation.

Similarly, on further comparison, of mean scores for field independent students having high achievement motivation (A_1B_1) and for field dependent students having high achievement motivation (A_2B_1) also differ significantly, that is, field independent students having high achievement motivation (A_1B_1) have significantly higher academic achievement than field dependent (A_2B_1) students having high achievement motivation.

Likewise, mean scores for field independent students having high achievement motivation (A_1B_1) and for field dependent students having low achievement motivation (A_2B_2) too differ significantly; indicating that field independent students having high achievement motivation (A_1B_1) have significantly higher academic achievement than the field dependent (A_2B_2) students having low achievement motivation.

However, further comparison of mean scores, indicating that field independent students having low achievement motivation (A_1B_2) and field dependent students having high achievement motivation (A_2B_1) have no significant relationship, which means that the groups do not differ significantly.

Again, comparison of mean scores, indicating that field independent students having low achievement motivation (A_1B_2) and field dependent students having low achievement motivation (A_2B_2) have no significant relationship showing that the groups do not differ significantly.

Once again, field dependent students having high achievement motivation (A_2B_1) and field dependent students having low achievement motivation (A_2B_2) also have no significant relationship meaning thereby that the groups do not differ significantly.

The interaction effect of cognitive styles and achievement motivation on academic achievement of 9th grade students has also been presented in the form of line graph in figure 4 showing a significant interaction effect of cognitive styles and achievement motivation on academic achievement.

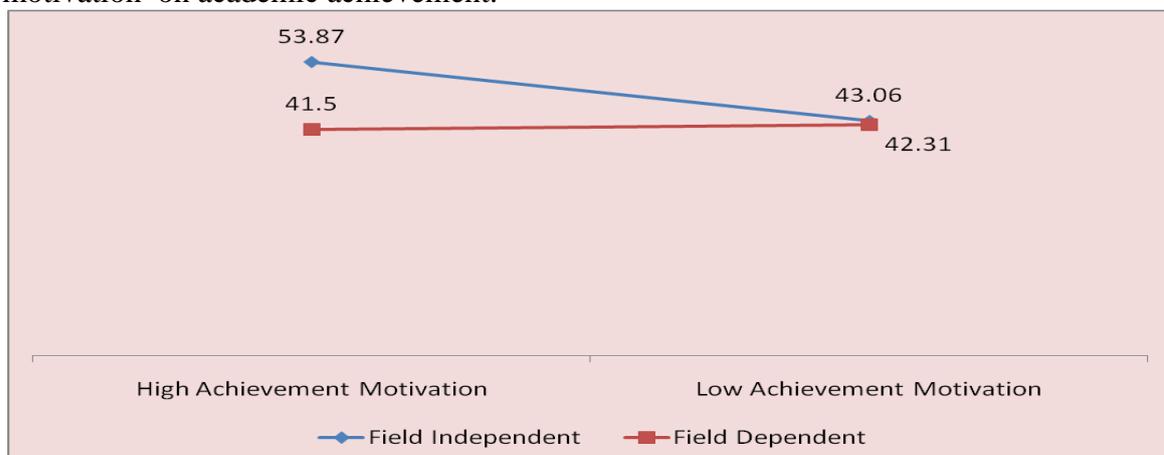


Figure 4: Interaction effect of Cognitive Styles (A) × Achievement Motivation (B) on Academic Achievement

Discussion of Results

The results obtained from the analysis are discussed in the context of hypotheses formulated earlier. The results already arrived at by various related studies have also been compared with the results of present study. This has been done to make the study more meaningful. The analysis of the pre-test stage finds no significant difference between the achievement scores of both the groups suggesting there by that they are almost equal and parallel groups fit for comparative study and experimentation along various dimensions put forth under investigation. The analysis of post-test stage finds significant effect of cognitive styles on academic achievement of students. The Findings thus seems to be in tune with the findings of a number of other scholars like: Nozari and Siamian (2015): the more the field independence, the higher the reading comprehension skills in learning English, resulting in more academic achievement; “there is significant relationship between FD/FI cognitive style and vocabulary learning strategies (Alipanahi and Mohajeri, 2013)”; “Field dependence/ independence is one of the most heuristic cognitive style constructs that consistently affects academic results of students and their educational level (Tinajero, Castedo, Guisande, and Paramo, 2011)”. Cognitive style (FD/FI) can be considered as an important factor which affects on language learning strategies (Naimie, Abuzaid, Siraj, Shagholi, and Hejailieís, 2010). “Field-dependent/independent cognitive construct can be considered as one crucial factor in reading performance (Behnam and Fathi, 2009)”; “Cognitive style (FD/I) has a significant correlation with learners’ success in reading performance (Blantonís, 2004)”; The finding of present study is also in consonance with the finding of Cognitive style (FD/FI) enhanced learners’ accuracy of pronunciation (Elliott, 1995).

Further, there was significant effect of achievement motivation on academic achievement of students. This finding seems to be compatible with finding like: achievement motivation is a predictor of academic achievement (Azar, 2013). Achievement motivation is significantly related to academic achievement (Awan et al., 2011) that also suggested that “teachers must use motivational strategies to involve students in academic activities for improving their grades; achievement motivation moderated relationship of learning approaches and academic achievement is significant” (Bakhtiarvand et al., 2011) and “there exists a significant positive correlation between students’ achievement motivation and their scores on comprehension learning, meaning orientation” (Abouserie, 1995), which also suggested that students with high achievement motivation are likely to adopt deep and elaborative approaches in their English readings than those of students with low achievement motivation.

The interaction effect of cognitive styles and achievement motivation on academic achievement was also found significant. This finding corroborates the finding of (Kumar, 2014), that is, cognitive styles, achievement motivation are positively and significantly correlated with academic achievement. Thus, the interaction of cognitive styles and achievement motivation through multimedia and traditional instructional strategies has significant influence on academic achievement of students.

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A Simple Technique to Solve Fuzzy Project Scheduling Problems

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Abstract: Time Cost Trade-off Problem is one of the highly important issues in project accomplishment. In this paper, a new solution approach is proposed for solving Fuzzy Time Cost Trade-off Problems. Also, it is an attempt to apply the method suggested in this paper to an actual construction project. The purpose is to evaluate the practical applicability of the method. This paper helps practicing project managers to have realistic expectations of the method. A comparative study has been carried out between the proposed method and methods suggested in various research articles.

Keywords: Fuzzy Project Scheduling – Linear Programming – Time Cost Trade-off Problem.

1 Introduction

In scheduling a project, it is generally considered to expedite the duration of some activities through extra budget in order to compress the project completion time. This process can be considered under either some fixed available budget or a threshold of project completion time. This problem is known as Project Crashing (or) Time Cost Trade-off Problem in project management. The main objective of these kinds of problems is to determine the optimal duration and cost assigned to the activities so that the overall cost is minimized. Hence this problem leads to a balance between the project completion time and total cost of the project.

In Time Cost Trade-off analysis, the objective of project managers is to schedule a project completion time in which total costs of project are in minimum. If there is a supposed budget in a project, the goal is to find the greatest reduction in project completion time using the specified budget. Duration of an activity can be decreased by hiring more workers or using extra resources. Costs required for these purposes are known as “direct costs”. For executing the project, other affairs such as monitoring, engineering and accounting are required. Costs required for these purposes are defined as “indirect costs” which are ordinarily computed per unit of schedule time in a project.

In real construction projects, time and cost of activities may face significant changes due to existing uncertainties such as inflation, economical and social stresses, labor performance, natural events such climate changes and etc. Therefore, total time and cost of the project may differ significantly because of these uncertainties. So, deterministic models of construction Time Cost Trade-off are not realistic. Using of uncertain model is capable of formulating vagueness of the dynamic conditions of real world, which gives more stability to solve Time Cost Trade-off Problems.

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2 Review of Literature

In the construction industry, contractors usually use previous experience to estimate project duration and cost. Time and cost are the two main concerns of construction projects. The trade-off between time and cost gives construction planners both challenges as well as opportunities to arrive out the best construction plan which optimizes time and cost to complete a project.

There are two different approaches that have been used to solve the Time Cost Trade-off Problems. These techniques can be grouped into two categories: Optimal based and heuristic based techniques. Optimization technique involves mathematical programming approach including linear programming, integer programming, dynamic programming whereas Heuristic technique involves genetic algorithm, Cost-loop method etc.

Since 1950s, Critical Path Method techniques are widely recognized as valuable tools for the planning and scheduling of projects. In 1961, Kelly did research on the Time Cost Trade-off Problems, which is a branch of the project scheduling problem through linear programming. Meyar and Shaffer (1963) and Patterson & Huber (1974) solved Time Cost Trade-off Problems through bounding algorithm.

Robinson (1975), De et al. (1995) and Elmaghraby (1993) have used dynamic programming to solve TCTP for networks that can be decomposed to pure series (or) parallel sub networks. Reda and Carr (1989) have used mixed integer programming to solve TCTP within related activities. Cusack (1985) and Demeulemeester et al. (1996) have developed linear programming and dynamic programming models to solve optimally the trade-off among time and cost. Moselhi and El-Rayes (1993) proposed a dynamic programming model by introducing a cost variable into the optimization process.

Vrat and Kriengkairut (1986), Azaron (2005) and Radasch & Kwak (1998) have presented goal programming models to crash project. In these models multiple goals are considered. Burns et al. (1996) had proposed a hybrid optimization approach that is a combination of linear programming and integer programming for determining the Time Cost Trade-off solution of construction scheduling problem. Zeinalzadeh (2011) demonstrated a mathematical model using MILP – LINGO 12 to minimize the total cost of a construction project. Ammar (2011) provided a new approach with a way of considering net present value in time cost decisions taking into account discounted cash flows.

Some researchers used Heuristic approach to solve Time Cost Trade-off Problems. Some examples of heuristic approaches are Fondahl's method (1961), Moselhi's structural stiffness method (1993), prager's structural model (1963) and Siemen's effective cost slope model (1971). Siemens has developed SAM (Siemens Approximation Method) algorithm which was ideally suited for hand computation and also is suitable for computer solution.

Feng et al. (1997) developed a Genetic Algorithm model that is an improvement of their earlier linear/integer programming model (Liu et al. (1995)). The model by Li and Love (1997) has formulated to produce the times by which each critical activity should be reduced. Chau et al. (1997) proposed a Time Cost Trade-off model using genetic algorithm. Zheng et al. (2004) introduced a multi-objective approach that aims to optimize the total time and total cost simultaneously by utilizing appropriate Gas concepts and tools. Hegazy (1999) developed a practical Genetic Algorithm model by implementing the GA protocols within Microsoft project. This model has demonstrated an improvement over the previous GA models. Li et al. (1999) proposed a methodological framework including optimization, sensitivity analysis and improved GA for build-operate-transfer projects. Ng

and Zhang (2008) presented a multi-objective approach known as the ant colony system to model time cost optimization problems so as to optimize the total project duration and total cost simultaneously. However, the above mentioned Time Cost Trade-off models mainly focused on deterministic environment.

Uncertainties such as inflation, economical and social stresses, execution errors of contractor, and natural events like climate changes etc., total time and cost of project may differ significantly. Therefore, project managers have paid special attention to uncertain scheduling. Uncertain scheduling models are categorized into two types: probabilistic models and fuzzy models.

Yang (2005) proposed a chance –constrained programming model to incorporate the variability of funding, which is quantified by the co-efficient of variation. The proposed model formulates financial feasibility as a stochastic constraint. In another attempt, Yang incorporated budget uncertainty into project Time Cost Trade-off in a chance constrained programming model.

Some authors have claimed that fuzzy set theory is more suitable to model these problems. With the development of the research on fuzziness, fuzzy set theory was also applied to project scheduling problems, originally by Prade (1979). Furthermore, many other authors, such as Chanas and Kumburowski (1981), Hapke and Slowinski (1993) and Kaufmann and Gupta (1988) discussed the fuzzy project scheduling. Wang et al. (1993) developed a model to project scheduling with fuzzy information. Also Hapke and Slowinski (1996) presented a generalized heuristic method for solving resource-constrained project scheduling problems with uncertain time parameters. Leu et al. (1999) developed a fuzzy optimal model to formulate effects of both uncertain activity duration and resource constraint.

The first work on the Fuzzy Time Cost Trade-off Problem was done by Leu et al. (2001). In Leu et al. (2001), the activity durations were characterized by fuzzy numbers due to environmental variations, and the fuzzy relationship between the activity duration and the activity cost was taken into account by membership function. Arikan and Gungor (2001) presented a fuzzy goal programming model for Time Cost Trade-off Problems. Leu et al. (2001) proposed a new fuzzy optimal Time Cost Trade-off method and GA approach and solve it. Ghazanfari et al. (2008) developed a new possibilistic model to determine optimal duration for each activity in the form of triangular fuzzy numbers.

Also Yousefli et al. (2008) presented heuristic method to solve a project scheduling problem by using of fuzzy decision making in fuzzy environment. Wang and Liang (2004) solved project management decision problem with multiple fuzzy goals.

Jin et al. (2005) gave a GA based fully fuzzy optimal Time Cost Trade-off model, in which all parameters and variables were characterized by fuzzy numbers and an example in ship building scheduling was demonstrated. Eshtehardian et al. (2008) established a multi-objective fuzzy time cost trade-off model, in which fuzzy logic theory was introduced to represent accepted risk level. Abbasnia et al. (2008) developed an approach for solving time cost trade-off problem affecting uncertainties on activity cost. Ke et al. (2010) introduced hybrid intelligent algorithm for Fuzzy Project Scheduling Problems. Chen and Tsai (2011) constructed membership function of fuzzy minimum total crash cost based on Zadeh's extension principle and transformed the time cost trade-off problem to a pair of parametric mathematical programs. Shakeela Sathis (2012) gave a new solution procedure based on location index for Fuzzy Time Cost Trade-off Problems. A practical fuzzy

ranking-based approach for project scheduling was proposed by Tolunay Gocken (2011). Elizabeth (2015) gave a solution procedure for Intuitionistic triangular Fuzzy Project Scheduling Problems.

In this paper, a new solution procedure is proposed to solve Fuzzy Time Cost Trade-off Problems. Also, it is an attempt to apply the method suggested in this paper to an actual construction project. The purpose is to evaluate the practical applicability of the method. This paper helps practicing project managers to have realistic expectations of the method. A comparative study has been carried out between the proposed method and methods suggested in various research articles.

3 Preliminaries

In this section, some basic definitions of fuzzy set, fuzzy number, triangular and trapezoidal fuzzy number and arithmetic operations of triangular fuzzy numbers, which are the basis for the development of fuzzy set theory, are reviewed.(Dubois, Parade 1980 and Kaufmann and Gupta, 1985)

Definition 3.1: Fuzzy set

Let X be a classical set of objects, called the universe. The characteristic function f_A of crisp set $A \subseteq X$ assigns a value either 0 or 1 to each member in X . This function can be generalized to a function $f_{\tilde{A}}$ such that the value assigned to the element of the universal set X falls within a specified range (that is $f_{\tilde{A}} : X \rightarrow [0,1]$). The assigned value indicates the membership grade of the element in set A . The function $f_{\tilde{A}}$ is called the membership function and the set $\tilde{A} = \{(x, f_{\tilde{A}}(x)) / x \in X\}$ defined by $f_{\tilde{A}}(x)$ for each $x \in X$ is called a fuzzy set.

Definition 3.2: Fuzzy Number

A fuzzy \tilde{A} defined on the universal set of real numbers \mathfrak{R} , is said to be fuzzy number if its membership function has the following properties:

- i. \tilde{A} is convex, that is $f_{\tilde{A}}(\lambda x + (1 - \lambda)y) \geq \min(f_{\tilde{A}}(x), f_{\tilde{A}}(y)) \quad \forall x, y \in X, \lambda \in [0,1]$
- ii. \tilde{A} is normal, that is there exists exactly one $x_0 \in \mathfrak{R}$ with $f_{\tilde{A}}(x_0) = 1$
- iii. $f_{\tilde{A}}(x)$ is piecewise continuous

Definition 3.3: Triangular Fuzzy Number

A triangular number \tilde{A} is a fuzzy number fully specified by 3-tuples (a, b, c) such that $a \leq b \leq c$ with membership function $\mu_{\tilde{A}}(x)$ is defined as

$$\mu_{\tilde{A}}(x) = \begin{cases} 0, & x \leq a \\ \frac{x - a}{b - a}, & a \leq x \leq b \\ \frac{x - c}{b - c}, & b \leq x \leq c \\ 0, & x > c \end{cases}$$

Definition 3.4: Trapezoidal Fuzzy Number

A trapezoidal fuzzy number \tilde{A} is a fuzzy number fully specified by 4-tuples (a, b, c, d) such that $a \leq b \leq c \leq d$ with membership function $\mu_{\tilde{A}}(x)$ satisfying the following conditions:

1. $\mu_{\tilde{A}}$ is a continuous mapping from \mathfrak{R} to the closed interval [0, 1].
2. $\mu_{\tilde{A}}(x) = 0 \quad \forall x \in (-\infty, a_1]$
3. $\mu_{\tilde{A}}$ is strictly increasing and continuous on $[a_1, a_2]$.
4. $\mu_{\tilde{A}}(x) = 1 \quad \forall x \in [a_2, a_3]$
5. $\mu_{\tilde{A}}$ is strictly decreasing and continuous on $[a_3, a_4]$
6. $\mu_{\tilde{A}}(x) = 0 \quad \forall x \in (a_4, \infty]$

$$\text{i.e. } \mu_{\tilde{A}}(x) = \begin{cases} \frac{x-a}{b-a}, & a \leq x \leq b \\ 1, & b \leq x \leq c \\ \frac{x-d}{c-d}, & c \leq x \leq d \\ 0, & \text{otherwise} \end{cases}$$

where a_1, a_2, a_3, a_4 are real numbers and the fuzzy number is denoted by $\tilde{A} = (a_1, a_2, a_3, a_4)$.

Definition 3.5

The fuzzy number u in parametric form is a pair $(\underline{u}(r), \overline{u}(r)), 0 \leq r \leq 1$ which satisfy the following requirements:

1. $\underline{u}(r)$ is a bounded monotonic increasing left continuous function
2. $\overline{u}(r)$ is a bounded monotonic decreasing left continuous function
3. $\underline{u}(r) \leq \overline{u}(r), 0 \leq r \leq 1$

The trapezoidal fuzzy number $u = (x_0, y_0, \alpha, \beta)$, with two defuzzifier x_0, y_0 , and left fuzziness $\alpha > 0$ and right fuzziness $\beta > 0$ is a fuzzy set where the membership function is as follow:

$$u(x) = \begin{cases} \frac{x-x_0+\alpha}{\alpha}, & x_0-\alpha \leq x \leq x_0 \\ 1, & x \in [x_0, y_0] \\ \frac{y_0-x+\beta}{\beta}, & y_0 \leq x \leq y_0+\beta \\ 0, & \text{otherwise} \end{cases}$$

And its parametric form is, $\underline{u}(r) = x_0 - \alpha + \alpha r, \overline{u}(r) = y_0 + \beta - \beta r$

Provided that, $x_0 = y_0$ then u is a triangular fuzzy number, and we write $u = (x_0, \alpha, \beta)$

3.1 Ranking Function

For an arbitrary trapezoidal fuzzy number $u = (x_0, y_0, \alpha, \beta)$ with parametric form $u = \underline{u}(r), \overline{u}(r)$, the magnitude of the trapezoidal fuzzy number u is

$$Mag(u) = \frac{1}{2} \int_0^1 (\underline{u}(r), \overline{u}(r) + x_0 + y_0) f(r) dr$$

Where the function $f(r)$ is a non-negative and increasing function on $[0,1]$ with $f(0)=0$, $f(1)=1$ and $\int_0^1 f(r) dr = \frac{1}{2}$. The function $f(r)$ can be considered as a weighting function. In

actual applications, function $f(r)$ can be chosen according to the actual situation. If $f(r)=r$, the magnitude of a trapezoidal fuzzy number u which is defined in (), synthetically reflects the information on every membership degree, and meaning of this magnitude is visual and natural.

Proposition: 3.1 The ranking function of $\tilde{A} = (a, b, c, d)$ by the definition of $Mag(.)$ is as follows:

$$(i.e.) Mag(\tilde{A}) = \frac{a + 5b + 5c + d}{12}$$

3.2. Similarly, the ranking function for the triangular fuzzy number $\tilde{A} = (a, b, c)$ is:

$$Mag(\tilde{A}) = \frac{a + 10b + c}{12}$$

3.2 Standard form of Fully Fuzzy Linear Programming Problem

Fully Fuzzy Linear Programming Problems with m fuzzy constraints and n fuzzy variables may be formulated as follows:

$$\begin{aligned} & \text{Maximize (or) Minimize } \tilde{Z} = \tilde{C}^T \tilde{X} \\ & \text{Subject to the constraints: } \tilde{A}\tilde{X} \leq = \geq \tilde{b}, \tilde{X} \geq 0 \quad (P) \\ & \text{where } \tilde{C}, \tilde{X} \in F^n(\mathfrak{R}), \tilde{A} \in F^{m \times n}(\mathfrak{R}) \text{ and } \tilde{b} \in F^m(\mathfrak{R}) \end{aligned}$$

Definition 3.6: Fuzzy Basic Solution

Given a system of simultaneous m fuzzy linear equations with n unknowns $m < n$, $\tilde{A}\tilde{X} = \tilde{b}$ where \tilde{A} is a $m \times n$ matrix of rank m . Let \tilde{B} be any $m \times m$ sub-matrix, formed by m linearly independent columns of \tilde{A} . Then, solution obtained by setting $n - m$ variables not associated with the columns of \tilde{B} , equal to $\tilde{0}$ and solving the resulting system, is called a fuzzy basic solution to the given system of equations.

Definition 3.7: Fuzzy Feasible Solution

A fuzzy vector $\tilde{X} = (\tilde{x}_1, \tilde{x}_2, \dots, \tilde{x}_n) \in F^n(\mathfrak{R})$, where each $\tilde{x}_i \in F(\mathfrak{R})$ is said to be a fuzzy feasible solution, if it satisfies the constraints and non-negative restrictions of the given Fully Fuzzy Linear Programming Problem.

Definition 3.8: Improved Fuzzy Basic Solution

Let \tilde{X}_B and \tilde{X}'_B be two fuzzy feasible solutions to the Fully Fuzzy Linear Programming Problem. Then \tilde{X}'_B is said to be an improved fuzzy feasible solution, if $\tilde{C}_B \tilde{X}'_B \geq \tilde{C}_B \tilde{X}_B$ where \tilde{C}_B is the cost components of the given Fully Fuzzy Linear Programming Problem

Definition 3.9: Fuzzy Optimal Solution

A fuzzy feasible solution \tilde{X}_B of the Fully Fuzzy Linear Programming Problem is said to be an optimum fuzzy solution, if $\tilde{Z}_0 = \tilde{C}_B \tilde{X}_B \geq \tilde{Z}^*$, where \tilde{Z}^* is the value of the objective function for any fuzzy feasible solution.

Theorem 3.1

Let $\tilde{X}_B = \tilde{B}^{-1} \tilde{b}$ be a fuzzy basic feasible solution of (P). If for any column \tilde{a}_j in \tilde{A} which is not in \tilde{B} , then the condition $(\tilde{Z}_j - \tilde{C}_j) < \tilde{0}$ hold and \tilde{y}_{ij} for some i , $\{i=1,2,\dots,m\}$ then it is possible to obtain a new fuzzy basic feasible solution by replacing one of the columns in \tilde{B} by \tilde{a}_j .

Theorem 3.2

Let $\tilde{X}_B = \tilde{B}^{-1} \tilde{b}$ be a fuzzy basic feasible solution of (P) with the value of the objective function $\tilde{Z}_0 = \tilde{C}_B \tilde{X}_B$ and if \tilde{X}'_B is another fuzzy basic feasible solution with $\tilde{Z}' = \tilde{C}'_B \tilde{X}'_B$ obtained by admitting a non-basic column vector \tilde{a}_j into the basis for which $(\tilde{Z}_j - \tilde{C}_j) \leq \tilde{0}$ and $\tilde{y}_{ij} > \tilde{0}$ for some i , $i = 1, 2, \dots, m$, then $\tilde{Z}' \geq \tilde{Z}_0$.

Corollary

If $(\tilde{Z}_j - \tilde{C}_j) = \tilde{0}$ for at least j which $\tilde{y}_{ij} > \tilde{0}$, $i = 1, 2, \dots, m$, then there exists an alternate fuzzy basic feasible solution for which the value of the objective function is unaltered.

Theorem 3.3

Let $\tilde{X}_B = \tilde{B}^{-1} \tilde{b}$ be a fuzzy basic feasible solution of (P). If there exist an \tilde{a}_j of \tilde{A} which is not in \tilde{B} such that $(\tilde{Z}_j - \tilde{C}_j) < \tilde{0}$ and $\tilde{y}_{ij} \leq \tilde{0}$, for all $i = 1, 2, \dots, m$, then the FFLP problem (P) has an unbounded solution

Remarks

1. If for all j , $(\tilde{Z}_j - \tilde{C}_j) \geq \tilde{0}$, then Fully Fuzzy Linear Programming Problem has a fuzzy optimal solution.
2. If there exist j such that $(\tilde{Z}_j - \tilde{C}_j) < \tilde{0}$, $\tilde{y}_{ij} \leq \tilde{0}$, for all $i = 1, 2, \dots, m$, then Fully Fuzzy Linear Programming Problem has an unbounded solution.

Theorem 3.4

A fuzzy variable $\tilde{x}^0 = (x_1^0, x_2^0, x_3^0)$ is an optimal solution of the Fully Fuzzy Linear Programming Problem if and only if x^0 is an optimal solution of the Crisp Linear Programming Problem equivalent to Fully Fuzzy Linear Programming Problem.

4 Problem Description, Basic Assumptions and Notation

Assume that a project has 'n' interrelated activities that must be executed in a certain order before the entire task can be completed in a fuzzy environment. In general, the environmental coefficients and related parameters are uncertain. Accordingly, the

incremental crashing costs for all activities, variable indirect cost per unit time, Maximum and minimum duration of the activity, specified project completion time are imprecise and fuzzy.

Linear Mathematical model is one of the suitable mathematical model for Time Cost Trade-off problem. Pre-assumptions of this kind of problem are:

- i. All precedence relationship between activities is 'Finish to Start type', which means that the activity cannot begin unless its predecessor activity gets completed.
- ii. The relationship between time and cost is linear.
- iii. Direct costs increase linearly as the duration of an activity is reduced from its normal value to its crash value.
- iv. The indirect costs comprise two categories, that is, fixed costs and variable costs, and the variable cost per time is the same regardless of project completion time.
- v. Normal, Crash durations and slope costs are uncertain and their values are denoted in the form of triangular fuzzy number.

Parameters and decision variables of model are as follows:

P The set of all arcs (i.e. activities)

n Number of nodes

\tilde{T}_i Starting time of event i

\tilde{C}_{ij} Planned cost of activity $i \rightarrow j$ (ie. Normal Cost + crash cost)

$C\tilde{C}_{ij}$ Crash cost of activity $i \rightarrow j$

\tilde{I} Indirect cost per day

\tilde{s}_{ij} Slope cost of activity $i \rightarrow j$

$N\tilde{C}_{ij}$ Normal cost of activity $i \rightarrow j$

$N\tilde{T}_{ij}$ Normal time of activity $i \rightarrow j$

$C\tilde{T}_{ij}$ Crash time of activity $i \rightarrow j$

$TF(\mathcal{R})^+$ Set of all positive Triangular Fuzzy numbers

4.1 Mathematical Model for Fuzzy Time Cost Trade-off Problems

A suitable mathematical model is chosen from the literature based on the available pre-assumption, constraints and objective criterion of the problem. The aim of the given mathematical model is to minimize the total project cost (including direct and indirect cost).

$$\text{Min } \tilde{C}$$

Subject to

$$\tilde{T}_1 = \tilde{0}$$

$$\tilde{T}_j - \tilde{T}_i - \tilde{D}_{ij} \geq \tilde{0}$$

$$C\tilde{T}_{ij} \leq \tilde{D}_{ij} \leq N\tilde{T}_{ij}$$

$$\tilde{C} = \sum_i \sum_j \tilde{s}_{ij} * (N\tilde{T}_{ij} - \tilde{D}_{ij}) + \sum_i \sum_j N\tilde{C}_{ij} + \tilde{I} * \tilde{T}_n$$

$$\tilde{T}_i \geq \tilde{0}, \quad \tilde{D}_{ij} \geq \tilde{0}, \quad \tilde{C} \geq \tilde{0} \quad \forall i \& j$$

5 Method to Solve Fully Fuzzy Time Cost Trade-Off Problem

In this section, a new solution approach is presented to find the solution for fully fuzzy time cost trade-off problems through linear programming technique:

Step 1: Formulate the mathematical model through Fully Fuzzy Linear Programming Problem (in section?) for the given Fuzzy Time Cost Trade-off Problem.

Step 2: Convert the reduced fully fuzzy linear programming problem into Crisp Linear Programming problem using ranking function given in section.

Step 3: Find the optimal solution of the reduced Crisp Linear Programming problem using existing solution procedure.

Step 4: Find the fuzzy optimal planned duration by substitute the values of D_{ij1} , D_{ij2} and D_{ij3} in $\tilde{D}_{ij} = (D_{ij1}, D_{ij2}, D_{ij3})$.

Step 6: Find the fuzzy optimal total cost of the project by substitute the values of C_1, C_2 and C_3 in the objective function $\tilde{C} = (C_1, C_2, C_3)$

6 Case Study

An engineer has accepted to build a simple residential house. He develops a list of works for the building project. Based on the available and required resources for each process, he calculates both a normal time and a least possible time for each activity which are used as normal time and crash time. The list of works is used to specify precedence relationships between activities of the project. Each work should be completed in order that the next work can be started; therefore, precedence relationships are considered as finish to start. Also, he estimates normal and crash cost for each activity based on the required resources for performing activity in normal and crash time. Furthermore, he determines indirect cost as currency unit per each time unit. Time unit in this project is day and currency unit is rupees. The following tables summarize the necessary data for this project.

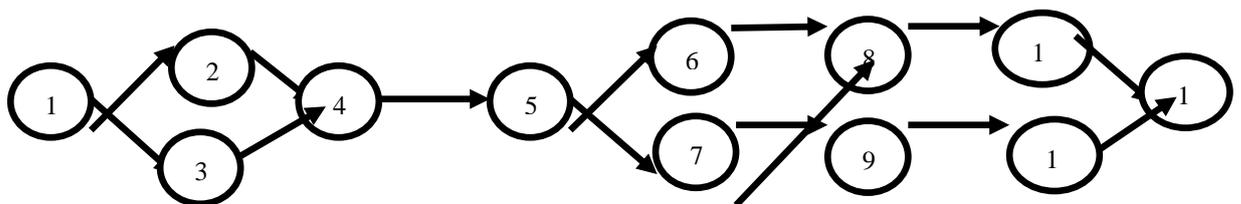


Figure 6.1: Network Representation of a project

Table 6.1: Description of the work

S. No.	Activity	Description of the work
1	(A) 1 → 2	Site preparation
2	(B) 1 → 3	Earth work
3	(C) 2 → 4	PCC and Concrete work
4	(D) 3 → 4	Plinth Beam
5	(E) 4 → 5	Brick work
6	(F) 5 → 6	Barbending
7	(G) 5 → 7	Centering work
8	(H) 6 → 8	Concrete work for roofing
9	(I) 7 → 8	Plumbing work
10	(J) 7 → 9	Electrical work

11	(K) 8 → 11	Plastering
12	(L) 9 → 10	Tiles work
13	(M) 10 → 12	Painting work
14	(N) 11 → 12	Other Miscellaneous work

Table 6.2: Details of the project

Activity	Maximum duration	Minimum duration	Maximum cost	Slope cost
A	(2, 2, 2)	(2, 2, 2)	(10000, 10000, 10000)	-
B	(7, 7, 7)	(7, 7, 7)	(22372, 22372, 22372)	-
C	(10, 11, 12)	(8, 9, 10)	(200561, 203859, 207158)	(5000, 6000, 7000)
D	(3, 3, 3)	(2, 2, 2)	(13449, 13449, 13449)	(1000, 1000, 1000)
E	(18, 21, 24)	(18, 21, 24)	(139489, 144804, 150120)	-
F	(10, 10, 10)	(9, 9, 9)	(109200, 109200, 109200)	(1000, 1000, 1000)
G	(6, 8, 10)	(4, 6, 8)	(85032, 87212, 89392)	(1500, 1500, 1500)
H	(20, 22, 24)	(18, 20, 22)	(57480, 62270, 67060)	(5000, 7000, 9000)
I	(4, 5, 6)	(3, 4, 5)	(45000, 50000, 55000)	(1500, 2000, 25000)
J	(6, 7, 8)	(6, 7, 8)	(70000, 75000, 80000)	-
K	(8, 9, 10)	(6, 7, 8)	(92797, 104679, 116562)	(8000, 10000, 12000)
L	(5, 5, 5)	(3, 3, 3)	(189803, 189803, 189803)	(10000, 12000, 14000)
M	(8, 10, 12)	(5, 6, 7)	(41302, 47472, 53641)	(4000, 8000, 12000)
N	(4, 6, 8)	(3, 5, 7)	(36200, 39700, 43200)	(1000, 1000, 1000)

Mathematical Model

Fully Fuzzy Linear Programming model for the above building project is given below:

$$\text{MIN} = (C_1 + 10 * C_2 + C_3)/12;$$

$$C_1 = 1112685 + C_{A1} + C_{B1} + C_{C1} + C_{D1} + C_{E1} + C_{F1} + C_{G1} + C_{H1} + C_{I1} + C_{J1} + C_{K1} + C_{L1} + C_{M1} + C_{N1} + 2000 * T_{121};$$

$$C_2 = 1159820 + C_{A2} + C_{B2} + C_{C2} + C_{D2} + C_{E2} + C_{F2} + C_{G2} + C_{H2} + C_{I2} + C_{J2} + C_{K2} + C_{L2} + C_{M2} + C_{N2} + 2000 * T_{122};$$

$$C_3 = 1206957 + C_{A3} + C_{B3} + C_{C3} + C_{D3} + C_{E3} + C_{F3} + C_{G3} + C_{H3} + C_{I3} + C_{J3} + C_{K3} + C_{L3} + C_{M3} + C_{N3} + 2000 * T_{123};$$

$$\begin{aligned} T_{11} &= 0; & T_{12} &= 0; & T_{13} &= 0; \\ T_{j1} - T_{i1} - D_{ij1} &\geq 0; & T_{j2} - T_{i2} - D_{ij2} &\geq 0; & T_{j3} - T_{i3} - D_{ij3} &\geq 0; \\ CT_{ij1} &\leq D_{ij1} \leq NT_{ij1}; & CT_{ij2} &\leq D_{ij2} \leq NT_{ij2}; & CT_{ij3} &\leq D_{ij3} \leq NT_{ij3} \\ C_3 - C_2 &\geq 0; & C_2 - C_1 &\geq 0; & D_{ij3} - D_{ij2} &\geq 0; D_{ij2} - D_{ij1} &\geq 0 \\ T_{i3} - T_{i2} &\geq 0; & T_{i2} - T_{i1} &\geq 0 \forall i & \& j \end{aligned}$$

The planned duration, crashing cost of each activity and total project costs have been determined using the solution procedure given in section. The results obtained from the above linear programming model for the project is as follows:

$$\begin{aligned} (C_1, C_2, C_3) &= (1254685, 1319820, 1384957) \ \& (T_{121}, T_{122}, T_{123}) = (70, 79, 88) \\ (D_{A1}, D_{A2}, D_{A3}) &= (2, 2, 2); \ (D_{B1}, D_{B2}, D_{B3}) = (7, 7, 7); \ (D_{C1}, D_{C2}, D_{C3}) = (10, 11, 12) \\ (D_{D1}, D_{D2}, D_{D3}) &= (3, 3, 3); \ (D_{E1}, D_{E2}, D_{E3}) = (18, 21, 24); \ (D_{F1}, D_{F2}, D_{F3}) = (9, 9, 9) \\ (D_{G1}, D_{G2}, D_{G3}) &= (6, 8, 10); \ (D_{H1}, D_{H2}, D_{H3}) = (20, 22, 24); \ (D_{I1}, D_{I2}, D_{I3}) = (4, 5, 6) \\ (D_{J1}, D_{J2}, D_{J3}) &= (6, 7, 8); \ (D_{K1}, D_{K2}, D_{K3}) = (8, 9, 10); \ (D_{L1}, D_{L2}, D_{L3}) = (5, 5, 5) \\ (D_{M1}, D_{M2}, D_{M3}) &= (8, 10, 12); \ (D_{N1}, D_{N2}, D_{N3}) = (3, 5, 7); \ (C_{F1}, C_{F2}, C_{F3}) = (1000, 1000, 1000) \\ (C_{N1}, C_{N2}, C_{N3}) &= (1000, 1000, 1000) \end{aligned}$$

7 Conclusion

In general, it is very difficult to model real life problems using precise terms in reality. After the development of fuzzy set theory, most of the real life problems can be modeled and solve using fuzzy terms. In project scheduling, to compute the duration and cost of each activity is very difficult because of uncertain environment. In Fuzzy Project Scheduling literature, many researchers have given the deterministic solutions (that is, deterministic planned duration & cost). Only some of the researchers provided the planned duration and cost in fuzzy. This is one of the attempts to give the Fuzzy planned duration and cost for Fuzzy Project Scheduling.

In this study, a new solution approach is given using Magnitude of a fuzzy number for Project Scheduling Problems in uncertain environment. A real residential construction project is considered as a case study to illustrate the validity of the proposed method. The computational results are listed. Also, a comparison has made with the other techniques for solving project scheduling in fuzzy nature.

Table 7.1: Comparison with other techniques

Solution Approach	Planned Duration	Planned Cost
Linear Programming Technique [16]	(70, 79, 88)	(1254685, 1319820, 1384957)
Linear Programming with GMIR[2]	(70, 79, 88)	(1254685, 1319820, 1384957)
Lexicographic Method [17]	(70, 79, 88)	(1254685, 1319820, 1384957)
Decomposition Technique [25]	(70, 79, 88)	(1254685, 1319820, 1384957)

Linear Programming Technique (Proposed Method)	(70, 79, 88)	(1254685, 1319820, 1384957)
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From the above table, it is clearly evident that the planned duration and cost obtained by proposed method for the real residential project are similar when compared with various techniques. We can conclude that the proposed method is the easiest one to solve Fuzzy Time Cost Trade-off Problems. Also Fuzzy Linear Programming Technique is the suitable model for real Project Scheduling Problems in uncertain environment.

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Factors Influencing Empowerment Of NHG Members In Kannur District, Kerala State

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ABSTRACT

The present study aimed to know about the factors influencing empowerment of Neighborhood Groups (NHGs) members in Kannur district, Kerala state. Women empowerment process is one where women find time and space of their own and reexamine their lives critically and collectively. Empowerment has been considered an effective tool to make changes in the socio-economic conditions of women. A nation, society and individual cannot progress adequately until the status of women in the region is improved,. The sample is taken from the Kudumbashree members of Kannur district, Kerala state. The sample population includes those members who were active in the Kudumbashree group. A pre-tested structured questionnaire prepared in formal language was used. The Kudumbashree members were individually met for collecting accurate data directly. The objective was used to identify the demographic variables of the respondents to analyze the difference between factors influencing overall empowerment of NHG respondents based on marital status and type of family. To examine the significant relationship between factors influencing empowerment and demographic variables. A random sample of 480 members was selected for the study. The statistical tests used were percentage analysis, F-test and correlation test. The result also found that there is a significant influence between factors influencing women empowerment and their marital status. Therefore it is concluded that marital status significantly influenced the factors influencing empowerment dimension. The statistical result reveals that there is a significant difference between factors influencing Decision Making, Freedom to mobility, Family support, Self-confidence, Legal Awareness, Sharing Roles in Domestic Matter, Communication, Leadership and Acquisition of Personal Skills of the respondents. The correlation between demographic variables and factors influencing empowerment is positively and significantly related with marital status, religion, occupation and place of saving.

Keyword: Empowerment, Group Factors, Personal factors, Education, NHG members.

Introduction

Empowerment is a multi-dimensional process, which should enable farm women or group of women to realize their full identity and power in all spheres of life (Surekharao and Rajamanamma, 1999). It consists of greater access to knowledge and resources, greater autonomy in decision making them to enable have greater ability to plan their lives, or to have greater control over the circumstances that influence their lives and free from shocks

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imposed on them by custom, belief and practice. Generally development with justice is expected to generate the forces that lead to empowerment of various sections of population in a country and to raise their status especially in case of women.

In the present century the terms farm women empowerment, women welfare, gender justice have come to light in the social, economic and political development perspective of both developed and developing nations. Traditionally women in all most every society have remained a second grade citizen. Hence, neither they are allowed to get themselves educated nor they were given legal rights in the property, government and in administration.

“Empowerment comes from women’s groups who seek to empower themselves through greater self-reliance. They have right to determine their own choice in life. They also seek to gain control and access to resources”.

Empowerment is process, which helps people to gain control of their live through raising awareness, taking action and working in order to exercise greater control. Empowerment is process, which helps people to gain control of their lives through raising awareness, taking action and working in order to exercise greater control. Empowerment is the feeling that activates the psychological energy to accomplish one’s goal (Indiresan, 1999).

Any attempt to improve the status of women should start with ‘empowerment’. Empowerment implies the creation of an enabling environment where individuals can fully use their capabilities to take charge the lives. The purpose of empowerment is to free someone from rigorous control and to give the freedom to take responsibilities for their own ideas and action to release the hidden resources which would otherwise remain inaccessible.

Women empowerment process is one where women find time and space of their own and begin to reexamine their lives critically and collectively. It enables women to look at old problems in new ways, analyze their environment and situation, recognize their strength and potentials, alter their self-image, access new kinds of information and knowledge acquire new skills and initiate actions aimed at gaining greater control over resources of various forms. Economic empowerment is nothing but making women aware about their role and importance in economic development and provide them space for attaining financial independence and account their significant contributions to the production process. Women empowerment initiatives through micro finance operations, micro enterprise promotion and convergent community action constitute the core activities of Kudumbashree. Meetings are convened on a weekly basis in the houses of NHG members. In the meeting, the various problems faced by the group members are discussed along with suggestions for improving the situation.

Women Empowerment

In many discussions and studies it is found that women have been treated as second class citizens of all across the globe. It is a fact that almost common everywhere, irrespective of the development index of a country, women have always been subjected to denied rights and support systems for their adequate functional growth. This situation is caused due to loss of women’s self-dignity as human beings over time under such conditions. Women are not independent entities. Especially in Kerala, they are found to be fully associated and dependent on men particularly in addition to other aspects in the context of intellectual and professional capabilities. One of the remedies then, is to improve the women status in society which has consequently become the goal of various Women empowerment

schemes. Empowerment has been considered an effective tool to bring about changes in the socio-economic conditions of women. A nation, society as well as the individual himself or herself, cannot progress adequately until the status of women in the region is improved, in the very least. Gandhi (1930) written about the role of women in society that "to call woman the weaker sex is a libel; it is man's injustice to woman. If by strength is meant brute strength, then, indeed, is woman less brute than man. If by strength is meant moral power, then woman is immeasurably man's superior. Has she not greater intuition, is she not more self-sacrificing, has she not greater powers of endurance, has she not greater courage? Without her, man could not be. If nonviolence is the law of our being, the future is with woman. Who can make a more effective appeal to the heart than woman?"

According to United Nations, Women's empowerment definition has five major components

- ✓ Women's sense of self-worth;
- ✓ Their right to have and to determine choices;
- ✓ Their right to have access to opportunities and resources;
- ✓ Their right to have the power to control their own lives, both within and outside the home;
- ✓ Their ability to influence the direction of social change to create a more just, social and
- ✓ Economic order, both nationally and internationally

Structure of Kudumbashree

Kudumbashree has three tiers community based organization (CBO) for its effective administration and decentralized operations. Neighborhood group (NHG) -This is the lowest tier consisting of 15 to 40 women members from poor families. Meetings are arranged on a weekly basis, in the house of one of the NHG members. The Area Development Society (ADS) is the second tier. ADS are formed at ward level- panchayat, municipality or a corporation by joining 10-15 NHGs. The Community Development Society (CDS) is the highest tier formed by union of all the ADSs in the respective panchayat, in 'rural' or municipality and in 'town' or corporation in city areas. It monitors the thrift and credit activities of NHGs at these levels i-e panchayat or municipality or corporation level.

Definition of NHG

Neighbourhood Groups (NHGs) are the primary units of the Kudumbashree community organisation. Ten to twenty women from a neighbourhood form a NHG.

Review of Literature

Beevi and Devi (2015) conducted a study with an aim to assess the role of NHG in empowering rural women and to identify the major constraints faced by women in Kollam District of Kerala. The study revealed that micro-enterprises are a practicable pathway for improving the economic status. Some factors like education, income and mass media contact were positively and significantly related to the role of the NHGs. The effectiveness of the NHGs in promoting women empowerment was found to be limited by only factors like hesitation to take up innovative scheme; difficulty in playing dual roles by women; lack of confidence, team spirit, effective leadership, managerial skills, working capital and transportation. These thus were found to be the major constraints faced by NHGs.

Minimol and Makesh (2016) did a study to identify the level of personal, social, economic and financial empowerment achieved by the members through NHGs. The data was collected from a sample of 200 members of 18 NHGs located within three villages of

Cherthala Taluk of Alappuzha, Kerala. Primary data were collected by employing a structured interview schedule, through participant observation, and direct personal discussions with the members of various NHGs. The study concluded that the concept of NHGs for rural women empowerment has not yet run its full course in attaining its objective.

Srinivasa Murthy, A.T. (2017) has conducted study on Women empowerment: Issues and Challenges. Women have to perform both family and professional responsibilities together without the help of their husbands. Women have to suffer a lot in their daily life to nourish their career as well as saving their family relationships. The study discussed issues and women problems in India. Such as selective abortion and female infanticide, Sexual harassment, Dowry and Bride burning, Disparity in education, Domestic violence, Child Marriage, Inadequate Nutrition, Low status in the family, Status of widows. The study empathizes social empowerment of women in following areas i-e education, health, Nutrition, drinking water and sanitation, housing and shelter, environment, science and technology, rights of the girl child, violence against women support of mass media, seeking help to institutional mechanisms. he suggested Panchayat Raj Institutions and the local self-governments should be actively involved in the implementation and execution of the National Policy for Women at the grassroots level. The international, regional and sub-regional cooperation towards the empowerment of women will continue to be encouraged through sharing of experience, exchange of ideas and technology, networking with institutions and organizations and through bilateral and multi-lateral partnerships.

Methodology

The population of the study is the Kudumbashree members of Kannur district, Kerala state. The sample population includes those members active in the Kudumbshree group. A pre-tested structured questionnaire prepared and formal language was used. The Kudumbshree members were individually met for collecting accurate data directly. A random sample of 480 members was selected for the study.

Statement of the Problem

The present study is made under the title “Factors Influencing Empowerment of NHG Members in Kannur District, Kerala State”. The study improve to living conditions of women empowerment in the country, the Government of India has been taking various policy and administrative initiatives since last few decades. Even though certain sectors of the women empowerment population had benefitted by the various sponsored initiatives of the state, the lion part of women population who belongs to the weaker and marginalized sectors continue to remain backward. In fact they are unaware of their rights and privileges, thanks to the poor literacy level and the publicity gaps in reaching out the target beneficiaries from the side of the administrators of these initiatives. Moreover, lack of coordination among institutions and agencies supposed to implement the program had destroyed the charm of the whole program resulting in wasted efforts, high delivery costs and scattered resources. Thus, at the grass root level, women were satisfied neither with economic betterment nor with socio-cultural face-lifts. In Kerala, the local self-government set up a mission to facilitate antipoverty initiatives through empowering women at grassroots level. At this juncture it will be logical to investigate and bring out the impact of such initiative on the development of women and to assess the situations if any, that inhibits the successful implementation of the women empowerment programs.

Objectives

The present study was undertaken with the following objectives:

1. To identify demographic variables of the respondents
2. To comprehend individual factors influencing overall empowerment of NHG members.
3. To analyze the factors influencing overall empowerment of NHG respondents based on married status.
4. To find out the overall factors influencing empowerment of NHG respondents based on type of family.
5. To examine the significant relationship between factors influencing empowerment and demographic variables.

Hypotheses

1. There is no significant difference between factors influencing overall empowerment of NHG respondents based on married life
2. There is no significant relationship between overall factors influencing empowerment of NHG respondents based on type of family.

Method of Data Collection

To collect the primary data standard questionnaire was used. The tools were circulated among the selected respondents and interview method also adopted.

Samples Size

A sample of 480 respondents was selected in Kannur district by using simple random sampling method.

Statistical Tools Used

The following statistical tools were used to analyze the data. They were

- **Percentage analysis**
- **F-test**
- **t-test**
- **Correlation test was used.**

Results and Discussion

Table-1: Distribution of the Respondents Based on Demographic Variables

Variable	Sub Variable	Number of Respondents	Percentage
Marital status	Married	304	63.3
	Widow	128	26.7
	Unmarried	34	7.1
	Divorced	14	2.9
	Total	480	100.0
Type of family	Nuclear	138	28.8
	Joint	342	71.2
	Total	480	100.0
Educational Qualification	Illiterate	34	7.1
	Primary	149	31.0
	Secondary	167	34.8
	Higher secondary	96	20.0
	Degree	34	7.1
	Total	480	100.0
Annual income	Below 15,000	252	52.5
	15,001 to 25,000	132	27.5
	Above 25,000	96	20.0
	Total	480	100.0

Reason for Joining NHG	Empowerment	259	53.9
	Economic	221	46.1
	Total	480	100.0

It is inferred from the frequency distribution of the respondents that 63.3 percent of the respondents are married, 26.7 percent of the respondents are widow, 7.1 percent of the respondents are unmarried and 2.9 percent of the respondents are divorced. So most of the respondents are married. Further in the case of type of family, 28.8 percent of the respondents belong to nuclear family and 71.2 percent of the respondents belongs to joint family. Based on educational qualification, 7.1 percent of the respondents are illiterates, 31 percent of the respondents completed primary education, 34.8 percent of the respondents while completed secondary education, 20 percent of the respondents completed higher secondary and 7.1 percent of the respondents are degree holders. . Also considering the annual income, 52.5 percent of the respondents earn below 15,000, 27.5 percent of the respondents earn between 15,001 to 25,000 and 20 percent of the respondents earn above 25,000. Further on the basis of reason for joining NHG, 53.9 percent of the respondents due to joining the reason for empowerment and 46.1 percent of the respondents due to economic reason.

Table-2: Factors influencing empowerment based on marital status of the respondents

Factor	Marital status	Mean	Std. Deviation	F-value	P-value
Decision Making	Married	16.66	3.24	42.828	0.001 S
	Widow	18.44	1.95		
	Unmarried	22.00	.47		
	Divorced	16.14	3.70		
Freedom to mobility	Married	12.26	1.94	83.639	0.001 S
	Widow	9.41	1.33		
	Unmarried	12.00	.63		
	Divorced	11.71	1.86		
Family support	Married	15.08	1.33	43.886	0.001 S
	Widow	17.69	3.83		
	Unmarried	17.00	1.47		
	Divorced	14.86	1.16		
Self confidence	Married	22.86	5.84	27.560	0.001 S
	Widow	22.23	4.31		
	Unmarried	31.00	1.26		
	Divorced	21.43	5.17		
Knowledge on Women Related Issues and Programmes	Married	25.51	3.46	207.957	0.001 S
	Widow	34.27	5.30		
	Unmarried	37.00	2.18		
	Divorced	24.57	3.36		
Legal Awareness	Married		3.15	11.174	0.001 S
	Widow	19.14	3.36		
	Unmarried	16.00	2.48		
	Divorced	19.29	3.17		

Sharing Roles in Domestic Matter	Married	9.93	1.00	153.223	0.001 S
	Widow	11.98	2.41		
	Unmarried	15.00	0.98		
	Divorced	9.71	1.06		
Involve in Community Group Work	Married	10.16	.36	101.502	0.001 S
	Widow	11.64	1.49		
	Unmarried	11.00	1.58		
	Divorced	10.00	1.36		
Communication	Married	13.47	3.26	15.037	0.001 S
	Widow	15.12	2.08		
	Unmarried	12.00	0.89		
	Divorced	14.00	2.88		
Leadership	Married	18.12	2.64	45.788	0.001 S
	Widow	21.69	3.83		
	Unmarried	19.00	0.74		
	Divorced	17.57	3.03		
Acquisition of Personal Skills	Married	10.75	2.03	3.156	0.001 S
	Widow	10.77	1.43		
	Unmarried	10.00	1.46		
	Divorced	9.71	1.89		

S-Significant

NS-Not Significant

The above table exhibits the difference between the levels of factors influencing empowerment of women on the basis of marital status. Considering the decision making there is a significant difference between factors influencing empowerment: $p < 0.001$. Unmarried groups have higher level of decision making, self-confidence, knowledge on women related issues and programmes and sharing roles in domestic matter than the other groups. Therefore it is concluded that the null hypothesis is rejected and the alternate hypothesis is accepted. The result also found that there is a significant influence between factors influencing women empowerment and their marital status.

Table-3: Factors Influencing Empowerment Based on Type of Family

Dimensions	Type of family	Mean	Std. Deviation	F-value	P-value
Decision Making	Nuclear	18.06	3.18	2.45	0.01 S
	Joint	17.27	3.18		
Freedom to mobility	Nuclear	12.41	1.28	6.40	0.001 S
	Joint	11.09	2.27		
Family support	Nuclear	16.36	1.02	2.52	0.01 S
	Joint	15.72	2.92		
Self confidence	Nuclear	24.57	6.57	3.32	0.001 S
	Joint	22.69	5.14		
Knowledge on Women Related Issues and Programmes	Nuclear	28.36	5.78	0.633	0.52 NS
	Joint	28.74	6.02		
Legal Awareness	Nuclear	16.58	0.97	11.7	0.001 S
	Joint	19.93	3.28		

Sharing Roles in Domestic Matter	Nuclear	11.41	2.17	3.87	0.001 S
	Joint	10.60	2.04		
Involve in Community Group Work	Nuclear	10.59	1.93	0.186	0.85 NS
	Joint	10.61	1.21		
Communication	Nuclear	10.61	1.24	20.6	0.001 S
	Joint	15.12	2.49		
Leadership	Nuclear	18.48	1.28	2.69	0.01 S
	Joint	19.37	3.82		
Acquisition of Personal Skills	Nuclear	11.45	1.88	6.15	0.001 S
	Joint	10.36	1.70		

The above table shows the mean, S.D, t-value and Level of significance between respondents opinion about the various dimensions of factors influencing empowerment on the basis of type of family. Considering the Knowledge on Women Related Issues and Programmes and Involve in Community Group Work, there is no significant difference in respondent's level of factors influencing empowerment. $p > 0.001$. Further the statistical result reveals that there is a significant difference in factors influencing empowerment on the Decision Making, Freedom of mobility, Family support, self-confidence, legal awareness, Sharing Roles in Domestic Matter, Communication, Leadership and Acquisition of Personal Skills. Therefore it is concluded that the null hypothesis is partially rejected and partially accepted.

Table-4: Correlation between Demographic Variables and Factors Influencing Women Empowerment

Demographic variables	Factors influencing women empowerment
Age	-0.907**
Marital Status	0.263**
Religion	0.571**
Type of Family	0.047
Caste	-0.694**
Educational Qualification	-0.044
Occupation	0.159*
Place of Savings	0.127*

The above table exhibits the correlation between demographic variables and factors influencing empowerment. In the positively and significantly related with marital status, religion, occupation and place of saving. Other variable such as age, type of family, caste, educational qualification are negatively correlated.

Findings

- The result also found that there is a significant influence between factors influencing women empowerment and their marital status. Therefore it is concluded that respondents level of marital status significantly influenced the factors influencing empowerment dimension.
- The statistical result reveals that there is a significant difference between factors influencing empowerment on the Decision Making, Freedom to mobility, Family support, Self-confidence, Legal Awareness, Sharing Roles in Domestic Matter, Communication, Leadership and Acquisition of Personal Skills.

- There is positive correlation between demographic variables and factors influencing empowerment.

Conclusion

The present study aimed to know about the factors influencing empowerment of Neighbourhood Groups (NHGs) members in Kannur district, Kerala state. A random sample of 480 members was selected for the study. The statistical tests used were percentage analysis, F-test and correlation test. The result also found that there is a significant influence between fact influencing women empowerment and their marital status. Therefore it is concluded that marital status significantly influenced the factors influencing empowerment dimension. The statistical result reveals that there is a significant difference between factors influencing Decision Making, Freedom to mobility, Family support, Self-confidence, Legal Awareness, Sharing Roles in Domestic Matter, Communication, Leadership and Acquisition of Personal Skills of the respondents. The correlation between demographic variables and factors influencing empowerment is positive and significantly related with marital status, religion, occupation and place of saving. The wise exploitation and utilization of the opportunities provided to kudumbashree enabled its members to become empowered to a great extent. However, there are some bitter experiences which make the members feel less comfortable, while need to be considered.

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Growth of SME Sector in India: The Role of Private Sector Banks

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Abstract

Banks finance is an important source of borrowing money for business. Especially with small scale and mid-sized industry, getting funding is a major challenge. Through detailed study of published literature, the research focuses on understanding the role of private banks in growth of SMEs in India. This has been done through analysis of the trend of banking system post liberalisation and momentum of SMEs during this period.

Keywords: Small and medium sized enterprises, SMEs, liberalisation, private banks.

Introduction

The small and medium sized enterprises are considered as growth engines in any economy. Their importance is even more strongly felt in emerging economies like India (Javalgi and Todd, 2011). The impact of their contribution is clearly reflected in increased number of employment, exports and industrial production. Although, they play a potent role in the economic development of a nation, they do face great challenges to sustain in global competitive scenario. Out of all; financial constraints is the major one (Zaidi, 2013). Talking in this parlance, the importance of banks has been greatly felt. Especially post 1990s, with financial reforms introduced in India, the number of SMEs and success rate have catapulted significantly (Salwan, 2012).

Literature Review

Importance of SMEs

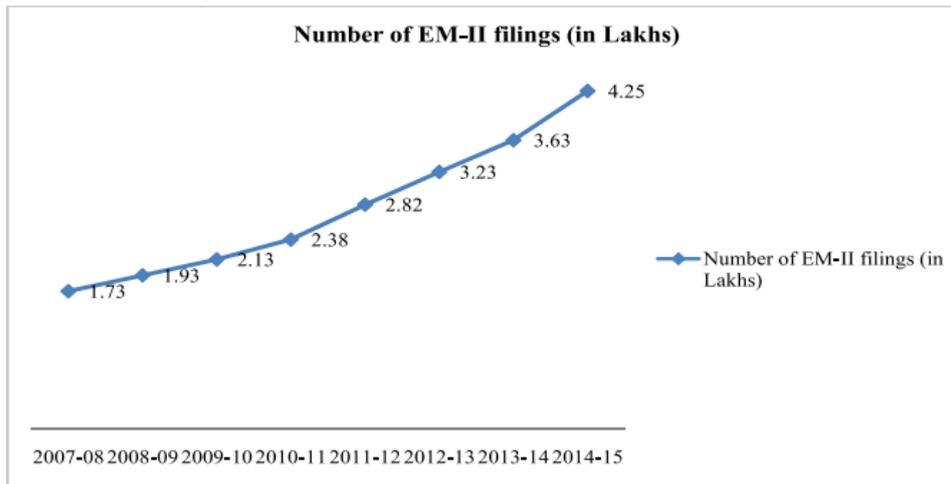
In different countries, the definition of Small and medium size industries (SME) differs (Ghose, 2001). Talking in Indian context, the firms with less than Rs. 2.5 million of investment in plant and machinery fall into the category of micro enterprises, Rs. 2.5 million to 50 million is termed as small scale industry and Rs. 100 million qualifies a firm as medium size industry. In terms of investment in equipment, there is a slight variation with Micro industry having Rs. 1 million, small scale firms with Rs. 1 to 20 million and medium size industries with Rs. 20 to 50 million. (Wade, 2008).

Small and medium size enterprises (SME) are probably not large in size but definitely do greatly impact the economy of any country. The fact that they account for more than 90% of all firms outside the agricultural sector of global economy testifies the same (Hussain, Farooq, and Akhtar, 2012). Over the years, SMEs have played a significant role in the economic development of India (Jeswal, 2012). According to recent reports; SMEs have contributed to 30% of Indian GDP (Hussain, Farooq and Akhtar, 2012). The growing impact of small and medium sized enterprises with respect to employment generation, manufacturing output and exports has also been noteworthy. As per the data, the SMEs

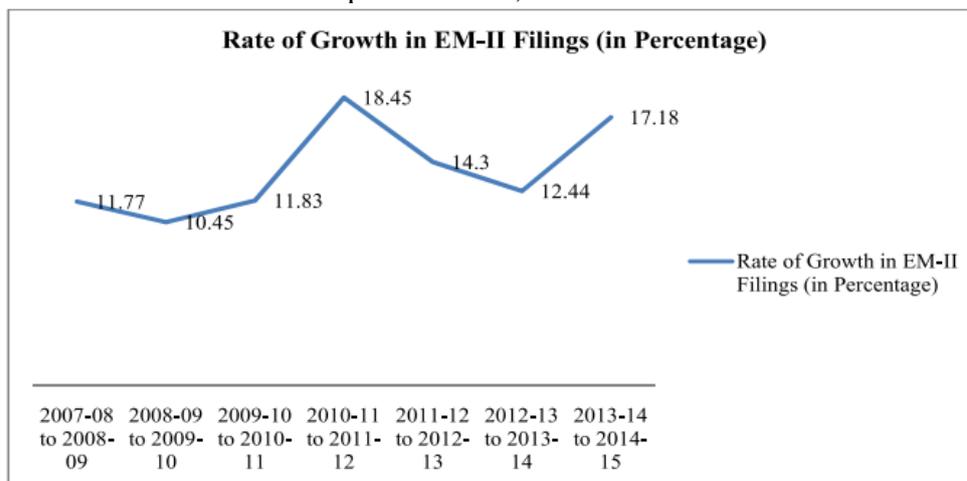
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account for nearly 40% in exports, 45 % in the manufacturing output (Pandya, 2012), and as high as 80 % in employment (Singh, Garg, and Deshmukh, 2008). In recent past, the number in SMEs has increased immensely. To claim the same, below figures present the growth in Entrepreneur Memorandum from 2007 to 2015.



Source: MSME Annual Report 2016-17, India



Source: MSME Annual Report 2016-17, India

The statistics clearly show a constant increase in number of such firms established over the years. Although a little dip in the percentage growth is during the impact of global crisis is seen; but there is no denial that the numbers kept growing over this period. Such are the impressive statistics but, the experts also do highlight the insufficient financial resources as one of the major challenges that SMEs face in emerging economies (Tung, and Aycan, 2008).

SME and financial challenges

Financial constraints, lack of efficient human resource and challenge in availing technological capabilities are some of the major concerns for SMEs (Singh, Garg, and Deshmukh, 2008).

Experts emphasize on the lack of investment capital and adequate finance as major barriers majorly hindering the growth of SMEs in developing countries like India. (Beck et al., 2006; Ayyagari, Demirgüç-Kunt, and Maksimovic, 2008; Tambunan, 2008; Hussain, Sib,

and Wangc, 2010; Hussain, Farooq, and Akhtar, 2012). One strong argument provided is that these enterprises which are usually labour -intensive firms, but when access to credit and capital is a constraint, it leads to reduced capabilities of the firms to face labour costs. Eventually; this causes business failure (Lin, 2007).

Indian Banking-history

Till 1990, this sector remained highly regulated. The development of financial system in India has then gone hand in hand with the economic reform post 1990 (Gupta, Kochhar and Panth, 2015).

The aim to bring liberalisation in banking system of India was to improve efficiency, and productivity as a whole in the Indian economy (Ray, and Das, 2010). Banking reform introduced during this period eased the regulations and which lead to restricted competition. As a result; this paved path to the entry of private banks as well as increased participation of foreign banks into the Indian markets (Shimizu, 2010). Financial liberalisation provides more flexibility to the banks by allowing setting interest rates and determining related policies which were earlier controlled by the government. This enhances efficiency and boosts economic productivity by providing a healthy and competitive environment (AtaullahCockerill, and Le, 2004).

Relationship between SMEs and Private Banks

Considering the complete framework of financing system in any nation, the widely spread and largely dominant component in this system are the banks. This point is even more relevant in terms of emerging and developing markets (Beck, 2007). Studies have shown that across countries, banks have been a major source of credit for small and medium size industries. Looking at the recent trends, experts argue that Banks see SMEs as growth engine and centre of profit abilities. This has led to an extended lending relationship between growing SMEs and banks, especially in developing countries where growth potentials are promising (Beck, et al., 2008). Looking at the positive momentum of SMEs in post liberalisation era, an evident co-relation between reforms and the growth of SMEs can be drawn (Dixit and Pandey, 2011).

Research Objective

The aim of the research is to study the recent growth of the small and medium size industries in India and understand the role of private sector banks in it.

Significance of the study

This research work will be helpful for the government, monetary authorities, policy-makers, and academics to understand the requirements of improving the SME sector by understanding the financial challenges in this domain.

Scope

The scope of the study is limited to the Indian context.

Hypothesis

H1: There is an important co-relation between the liberalisation of Indian banks and growth of Small and medium size industries in India.

H0: The null Hypothesis state that there is no noticeable co-relation between the liberalisation of Indian banks and growth of Small and medium size industries in India.

Design

The design of this study is mainly secondary research. The related literature have been thoroughly studied about the banking system post 1990s .The growth pattern of SMEs post

reform has been observed and prudent interpretation has been drawn looking at any relevant co-relation between the two.

Data Analysis and interpretation

As per the reports, with impressive GDP growth of 7.6%; India has topped in the outlook charts of World Bank for financial year 2015-16. The recent past witnessed escalated growth of SMEs and start-ups with India boosting today a magnificent SME base of 38 million; just after China with 52 million (India Brand Equity Foundation 2016). Such accelerated growth of SMEs has been witnessed by Indian economy with a 4.5% of stable pace of increase, consistently some last years. Over 6000 products ranging from traditional items to high-tech ones are manufactured by these small ventures in India. This trend is expected to grow in coming future with the SMEs market of emerging technologies expected to touch \$25.8 billion in 2020 (Economic Times 2017a)

It is expected that the GDP of India will touch 8.5 % by the year 2025 and MSMEs will keep playing an instrumental role in that. Looking at this, presently banking efforts are evident in financing these SMEs (SME Venture, 2017). The data suggests that MSME of manufacturing domain alone contributes to the 8% of the GDP of India, 45% of the total output and 40% of exports although, such data reflects the significant contribution of SMEs in growth but they struggle to get financial backing. Usually, the traditional banking institute refrain from financing these ventures to avoid high cost of transaction which account due to small ticket size of loan amount and for per client revenue being low (India Brand Equity Foundation, 2017). Interesting to note that many financial institutions have emerges as custodians for these firms. Currently, SMEs are availing the convenient lending options from private banks and Non-banking Financial companies (NBFCs) (India Brand Equity Foundation, 2016). As per The reports of Reserve Banks of India, the funds needed in SME sector is close to 26 lakh Crore rupees but these ventures struggle to meet. This can be understood from the fact that only 40% of this requirement is what the traditional banking has been able to fulfil. Although, many established banks have extend loans facilities to SMEs, based on their credit worthiness still the struggle prevails. Increasingly, along with private banks NBFCs also getting involved in financing MSMEs in recent past to fill this gap of funding (Business Line, 2017). Special schemes and models have been adopted in this regard (Confederation of Indian Industry 2013). Looking at the stats, it is evident that in 2016 the loan frame in India grew rapidly. Within a short time frame of one year, loan request from SMEs has crossed over \$1 million (Economic Times, 2017b). The data of 2015 posted by banks of claim a lending of over 8 million to SMEs (Economic Times, 2015). Enormously growing and flourishing SME sector accounts for 9% of the GDP of India. Data forecasts that in coming years this sector is expected to generate employment opportunities as high as 59 million; through 26 million units across the country (SME Venture 2017).

Hypothesis testing

The hypothesis claims that there is an important co-relation between the liberalisation of Indian banks and growth of Small and medium size industries in India, whereas; the null Hypothesis state that there is no noticeable co-relation between the liberalisation of Indian banks and growth of Small and medium size industries in India.

The multiple related literatures were studied in order to draw parlance with the same. The study presented by MSME Annual Report is one strong evidence to the fact of their unprecedented growth in recent years. With liberalisation, the fact suggests a growth in

private banks sector as well. Long with it the statistics suggests that the forecasted growth rate of SME would reach 4.5%. This strengthens the stated hypothesis.

With the increase in demand of capital for small ventures, rapid is the pace of financing institute in meeting this need. With a large share of 40% of it already being met and private banks taking interest in expansion of MSMEs supports this statement. The years of the start-up boom overlapping with post liberalisation era draws a strong connection here between the two. This is further justified by the logic that ease brought by the liberalisation opened doors for private banks to enter in Indian markets. The loan frame of SMEs has increased and number of start-ups as stated has steadily increased reaching to 48 million. This trend with respect to the fact of multiple private banks and NBFCs lending capital to SMEs leads to an inference that these institutes are fuelling the growth of SMEs by providing essential credit resources. Clearly, such strong inferences negate the null hypothesis.

In addition to above deduction from relevant data, the important contribution of 9% in the GDP of the nation also reflects the importance of the MSME sector and how they are seen as a profit centre by banks. Also, the extensive schemes specifically adopted by the banks to support lending to SMEs testifies this statement,

In light of potent research work with strong statistics to support, the hypothesis stands justified.

Recommendation

Looking at promising future of SMEs, financial institutions, government and banks are expected to understand the financing needs of these firms. Active schemes and supporting lending practices are needed. Prudent regulations, government policies and a flexible environment will foster the growth of SMEs, and this is what especially the emerging economies must focus on.

Conclusion

Undoubtedly, the growing small and medium sized industries are backbone for developing countries like India, promising a bright future through accelerated economic growth. The biggest challenges they face is of finance, but with more ease of private banks entering Indian markets post liberalisation have opened channels for this as well. Credit allocation to SMEs is considered as one profitable scheme by the banks. In this regard more prudent regulation is what policy makers must aim at.

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Impact Of Digital HR Practices on Strategic Human Capital Management and Organizational Performance in IT Sector

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Srihari. S**

Abstract

In the present scenario, a thorough understanding of organization's value creation model and ability to develop competencies through improved processes, better technology and motivated people are essential to ensure that the Human Resource (HR) function is aligned vertically and horizontally to produce superior results. With this understanding, HR function can better articulate how it can improve HR decision making, processes, people, and customer outcomes and business results. Automation is the way to enhance HR exercises in an organization and eventually in accomplishing organization objectives. From a more extensive point of view, Digitalizing HR practices bring about a very well-organized entity with better-educated individuals. The present best-of-breed Digital HR Practices robotizes everything identified with HR into a single online worldwide programming framework. It furnishes crucial HR components as well as presents cutting edge qualities that make human resources more efficient and enhance organization's crux.

Keyword: Digital HR; Digital HR Practices; HRIS; Digital HRIS; Digital Human Resource

Introduction

In the current scenario, an exhaustive comprehension of association's esteem creation model and capacity to create capabilities through enhanced procedures, better innovation and propelled individuals are basic to guarantee that the Human Resource (HR) work is adjusted vertically and on a level plane to deliver prevalent outcomes. With this knowledge, HR capacity can judge how it can enhance HR basic leadership, procedures, individuals, and client results and business outcomes. The HR functions are required to build up the abilities expected to evaluate how associations establish esteem and adjust the HR capacity to execute the organizations strategy.

The association must convey an incentive through planning individuals, procedures and innovations and there is a need to build up an arrangement to structure an association's kin, procedures and advances to make most extreme incentive for partners. The arrangement of HR ought to be in such a route in order to amplify worker execution.

Automation is the key to enhance HR activities in an organization and eventually in accomplishing organization objectives. The exploration results have demonstrated that organizations utilizing programming to proficiently deal with their human capital parts are seeing a more prominent benefit and upper hand over others. Via computerizing routine HR assignments, the associations can focus on building up the workforce and building a vital accomplice (Chamaru De Alwis, 2010).

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Information is an essential element for administration. On time, precise and important data is vital for arranging and decision making. The data framework is an arrangement of composed method which when executed, gives facts to help, arranging and basic leadership.

From a more extensive point of view, Digitalizing HR practices bring about a very well organized entity with better-educated individuals. Activities turn out to be more effective, work duplication is killed and HR organization turns out to be more streamlined. Above all individuals can invest more energy in basic leadership and key arranging and less time on data information and everyday HR organization. Such automation appears to assume critical parts for Human Capital Management (HCM) in light of the fact that Digital HR process capacities enhance HCM as far as regulatory purposes and scientific purposes. Despite the fact that Digital HR Practices is as yet being utilized for regulatory finishes as opposed to systematic closures, the future utilization of Digital HR Practices will be in vital decision-making process. Workers currently can get to the data on their cell phone and on their PCs utilizing portable information cards.

Digital HR Practices is winding up progressively essential in assisting modern associations with managing their human resources successfully. In view of Aberdeen's criteria, research proposes that utilizing a completely coordinated HR framework to streamline and enhance general tasks can enable organizations to end up as pioneers in their separate enterprises. As per a Report by Aberdeen Group Report 2007 the organizations which were utilizing completely coordinated framework for ability administration will probably accomplish best in-class status. As these frameworks advance and convey perpetual usefulness to HR, utilizing them is turning into the standard and a key expertise for any expert in the HR business. The present best-of-breed Digital HR Practices robotizes everything identified with HR into a single online worldwide programming framework. It furnishes crucial HR components as well as presents cutting edge qualities that make human resources more efficient and enhance organization's crux. These frameworks mechanize work process to enhance effectiveness and empower organizations to track, oversee and dissect information for all representatives from candidates to retirees. They join conventional HR with ability administration and announcing instruments that give an entire portfolio of an organization's workforce for better key arranging (Alok and Ibrahim, 2010).

It is just impossible to meet HR challenges in today's world without the use of Innovative technology. Individuals need to work in associations having the most recent innovation and this is the essential contribution to be a chosen employer. Vast organizations utilize investigative instruments to deal with their human capital, compute its esteem and adjust the workforce for most extreme efficiency. The Internet Technology is revolutionizing most parts of business, including the HR work and in the meantime, it is presenting new courses in conveying HR administrations. The innovation has changed the HR capacity to savvy robotized frameworks that enhanced the adequacy of workforce arranging and educated decision making.

Literature Review

The historical backdrop of Digital HR Practices starts from finance frameworks in the late 1950s and proceeds till the 1960s when the main computerized representative database was utilized (Walker 1993, Martinsons 1997)) shows how a "genuine" faculty framework was characterized in the late 1960s. According to Martinsons, "the main work force frameworks were made to store a gigantic measure of information for record keeping and

revealing things related with faculty organization. Over a period of time, the improvement in HR activities created the plan, advancement and the effective usage of different PC based Digital HR Practices".

As per Kavanagh et al (1990) "HRIS as a System used to gain, store, control, investigate, recover and circulate data in regards to an organization's HR. An HRIS isn't just PC equipment and related HR – related programming; it additionally incorporates individuals, structures, approaches and strategies, and information". The HRIS is generally a piece of the association's bigger Information System. Old manual frameworks are slowly supplemented by mechanized HRIS.

Kovach et al.(1999), characterized HRIS as a "precise strategy for accumulating, preserving, organizing, recovering, and validating information required by association about its HR, work force exercises, and association unit qualities. Moreover, HRIS shapes an incorporation between human asset administration (HRM) and Information Technology."

Lengnick – Hall (2002) portrayed e-HR into three structures: distributing Information, mechanization, and alteration. They alluded e-HR parallel to web based business to lead business exchange identified with human asset utilizing internet. e-HR helps HR supervisors' part change from issues master to vital business accomplice. e-HR can immediately refresh their profile in the event of any change and will counsel human asset experts just when they view it as important, assisting HR experts with being engaged with key exercises instead of doing simply routine authoritative work.

E-HR is a Digital HR Practices programming having conveyance stage as Internet. Conveying human asset administrations on the web (e-HR) underpins more effective accumulation, stockpiling, dispersion, and trade of information, Hendrikon (2003). Most associations set up intranets principally for representatives, yet they can reach out to business accomplices and even clients with fitting exceptional status, (Tripathi, 2011).

As indicated by Singh (2003), it isn't just vital to recognize HR skills as per the business needs and creates determination and advancement practices to anchor those capabilities, but also to develop and actualize an execution assessment arrange for the connections between employee performance and the key objectives.

Theoretical Background

Walker(1993) is characterized Digital HR Practices as "a PC based technique for gathering, conserving, organizing ,recovering and validating certain information required by an association about its workers, candidates and previous representatives."

As characterized by Hendrickson(2003) "A Digital HR Practices isn't just restricted to the PC equipment and programming applications that involve the specialized piece of the framework, but it likewise incorporates the people, policies, methods, and information required to deal with the HR work."

The Digital HR Practices keeps track on following exercises payroll, time and attendance, evaluation performance, benefits administration, HR administration data system, recruiting, learning management, training system, performance record, worker self-service, scheduling, nonattendance management, Digital HR Practices is an apparatus which helps the HR expert to give quicker administration, of better quality, which is consistently connected, thus helping the association to attain strategic advantage.

Different types of Digital HR Practices

Like other PC based Information Systems, Digital HR Practices can likewise be put under essential three classes: Electronic Data Processing (EDP), Management Information Systems (MIS), and Decision Support Systems (DSS). As indicated by Sprague and Carlson (1982), HR exercises can be characterized into three general classifications: Transactional, Traditional, and Transformational. An EDP-based classification of Digital HR Practices was the soonest frame presented in the HR field and took into account the value-based level, everyday HR exchanges that need to bargain for the most part with record keeping—for instance, entering financial data, representative status changes, organization of worker benefits and so forth. MIS-based Digital HR Practices developed as innovation enhanced after some time, and concentrated on conventional level of HR exercises, as for enlistment, choice, and pay. Digital HR Practices at DSS centers around transformational level of HR exercises i.e., increasing the value of hierarchical procedures. Human Resource Decision Support System (HR-DSS) empowers basic leadership and determining capacities of HR administrators. It for the most part incorporates instruments by which clients or framework chairmen can create specially appointed reports and select particular cases or subsets of cases for show. Some modern HR-DSS can likewise reenact (or 'demonstrate') a scope of business circumstances, and in this way, assist the business with seeing how individuals will respond to various business offers or work circumstances and that if the displayed circumstances are sensible. Kavanagh (1990) named HR-DSS as Human Resources Management Decision System (HR-MDS). They portrayed it as the perfect framework since it gives basic data to decision making and in this way, ought to be utilized as a standard for building up any Digital HR application.

Components of Strategic human capital management practices:

There are numerous factors assimilated in SHCM practices. It relies upon the size of utilization HR adopts in the associations. There are some Digital HR Practices bundles which are known as independent applications, customer server applications and online applications. There are number parts offered by ERP designers in Digital HR Practices.

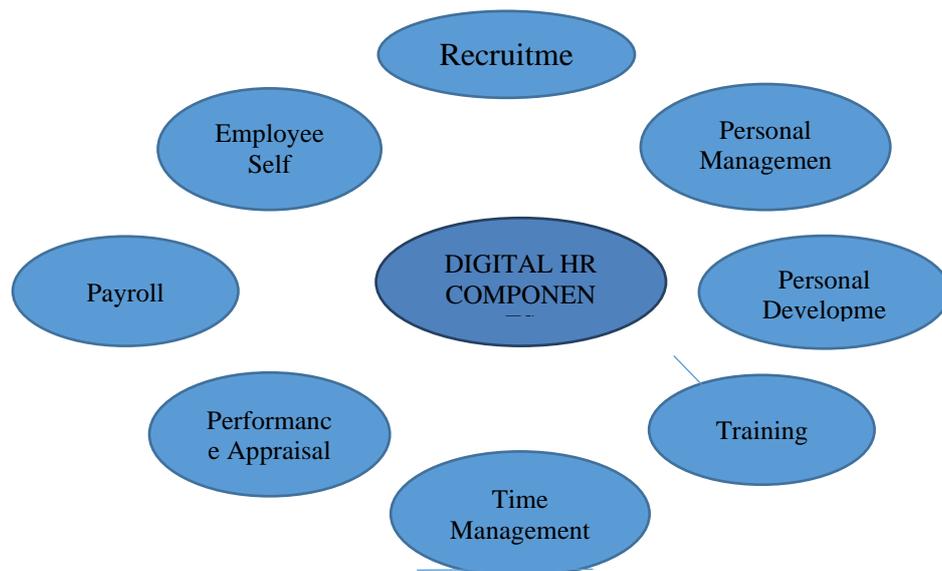


Fig 1: Digital HR Components Model

Recruitment: The enlistment segment is utilized to do the whole enrollment process from entering candidate information to staffing a position. This module is utilized for both inside and outside candidates. This module bolsters in speaking to staffing necessities, publicizing, overseeing and choosing candidates, and candidate's correspondence.

Staff Management: Integration amongst Recruitment and Personnel Administration empowers the candidate information to be exchanged as worker information, which you at that point need to supplement. Worker information is stored in database as representative records. The information can be shown, duplicated, edited and erased.

Work force Development: In the Personnel Development part, you can design and acknowledge staff improvement and further instruction and preparing for your representatives, with amalgamation of Training and Event Management. The faculty advancement necessities result from a correlation of the prerequisites of the activity and the employee's existing capabilities. Employee's execution and conduct can be assessed, the aftereffects of which give data to worker advancement arranging.

Training and Event Management: Training and Event Management is an exceedingly incorporated segment that reinforces planning, executing and overseeing instructional classes and business occasions. Training and Event Management is a perfect apparatus for continually broadening and refreshing the employees' learning. For instance, the connection with Personnel improvement empowers to recognize capability deficiencies and respond with focused preparing.

Time Management: Time administration segment bolster all the procedures that affect planning, recording and valuating employee's participation and sabbatical time. Data concerning employee's accessibility and work performed by them is an imperative component in HR. It is additionally utilized as a part of different zones, for example, controlling and strategic. Data accessible through framework is utilized as contribution for finance estimation.

Performance Appraisal: This part assesses singular execution relying on the criteria chose by the association. It gives expected adaptability to choose measurements based on occupation, occasion and task given to a person.

Payroll: The Payroll module is utilized for computing each employee's compensation of work, auto increase, relay of pay to employee's bank account, creating statutory reports required and so on.

Individual Cost Planning: Individual cost planning underpins business forms that range beyond the limits of divisions and applications. Data about installment can be retrieved from different sources to make individual cost design.

Career Planning: HRIS could record anticipated positional moves. The framework must be equipped to furnish progression intends to distinguish which representatives have been reserved for which position.

The Employee self-benefit module: This module allows representatives to inquire HR related information and play out some HR exchanges over the framework. Workers may question their participation record from the framework without requesting the data from HR staff. The module additionally gives directors a chance to affirm O.T. demands from their subordinates through the framework without over-burdening the undertaking on HR division.

Need for Digital HR Practices

Generally, HR specialists were applying the most critical extent of time and exertion at the managerial level; trailed by the operational level and in conclusion, the technique level yet the opposite created a HR esteem include.

Because of globalization Human asset administration is a fundamental factor of any fruitful business. Digital HR Practices is indispensable to basic leadership and assumes a critical part in the achievement of the association. Digital HR Practices is a stage for the association to be more aggressive through legitimate correspondence with different frameworks. It lessens the limits of the framework which generates barrier for both vertical and horizontal correspondence inside the association. Worker ends up independent, to convey and to share understanding. Digital HR Practices is one media which decrease the boundaries of interchanges to enhance association execution. Territories like e-learning, learning, administration, discourse database and community figuring help in employee's improvement and upgrade the expertise and offer information/involvement with others. Digital HR Practices engage HR Manager as well as workers of the association.

As stated by Hendrikson (2003), An all-around outlined Digital HR Practices can fill in as the principle administration instrument in the arrangement or incorporation of the HR office objectives with the goals of long haul corporate strategic planning .According to Carrell et al.(1999)¹⁹ HR information should be exhibited to supervisors to help basic leadership in the association. This general idea is known as Decision Support System (DSS). With the expanding significance of HR issues as basic factors in strategic planning and basic leadership, the capacity of the Digital HR Practices to measure, examine and display change turns out to be critical. Viable Digital HR Practices abilities can furnish an organization with focused and key preferred standpoint while experiencing a change procedure.

The most praiseworthy component of this framework is that it has expanded straightforwardness that prompts better correspondence with clients. Particularly the cooperation with the client network is the key favorable position of Digital HR Practices.

Objectives of the Study

1. To survey the ramifications of Digital HR Practices on individuals and process viability.
2. To assess the ramifications of Digital HR Practices on authoritative execution.

Digital HR Practices for Organizational Development

Digital HR Practices for Organization Development: As indicated by French and Bell, hierarchical advancement is an orderly procedure for applying conduct science standards and practices in association to expand individual and authoritative adequacy. It is concentrating on making collaboration inside the association for reasonable superior by remembering all frameworks and subsystems. Worldwide rivalry and financial motion have uncovered the shortcomings of association. They keep on being congested with a similar old bulky and moderate work process and wasteful interior structure. There is a need, for administrators to dependably consider mantras – reengineering, rebuilding and change in a journey to wind up as globally competitive. The motivation behind hierarchical improvement is to expand the adequacy of the association by building up the idle abilities of the individual members which help the methods for cooperating and accomplishing desired objectives. Associations are thought to be genuinely viable just when there is a common domain that is ideal for both the association and the person to develop and create.

Associations keeping in mind the end goal to survive and develop in the aggressive world need to adjust to new innovation, new markets and new difficulties. In today's focused world quality, speed and convenient conveyance are basic for survival of the association. The authoritative capacity to react to the clients and partners or be the first to market may have a critical effect as time is at a premium. Associations which are versatile and grow new innovations and receive changes faster in the commercial center are the ones that will survive the opposition. (Incorporate to computerized hones in IT SECTOR)

Digital HR Practices is a feature of changing HR patterns and in the ongoing circumstances HR capacities are being supplemented by innovation. Most of the IT firms are restoring few HR related frameworks, for example, a work force database, finance framework and advantages framework, with one Digital HR Practices that does everything. Numerous HR individuals in IT associations focus on the enhanced detailing and preparing that will be acknowledged from the new framework and those are the reasons most firms execute another Digital HR Practices. While HR data frameworks are presently broadly utilized - as indicated by the CIPD's 2005 study, People and Technology, around 77% of all associations utilize some type of Digital HR Practices - it isn't evident whether they are having the coveted impact and whether the HR experts are utilizing the innovation to its full limit?

Digital HR mix of programming and frameworks are related with overseeing worker information about enrollment and determination, finance, training and improvement, leave administration, ability administration, execution examination and related HR capacities. Digital HR Practices is hence about innovation to oversee HR capacities. A basic perspective of Digital HR Practices applications is appeared through IPO display which stands for Input, Process, and Output. According to the perspective of Gerardine DeSanctis (1986) late improvements in innovation have made it conceivable to make a continuous data based, self-benefit and intelligent workplace. Work force Information Systems have advanced from the robotized worker record keeping from the 1960s into more intricate announcing and choice frameworks generally 1980.

A Digital HR Practices isn't just PC equipment and programming yet it additionally incorporates individuals, structures, arrangements and systems and information. Ideal from labor necessity to vocation way, grievances, worker welfare, up to post retirement in every last stage the HR office is in terrible need of right, solid, correlated and auspicious data to take right choice. Digital HR Practices is a device to complete HR activities all the more effectively and proficiently. Each administrator needs to be auspicious and rectify data to take right choice. Digital HR Practices causes and help to the HR supervisor to do the HR undertakings all the more effectively.

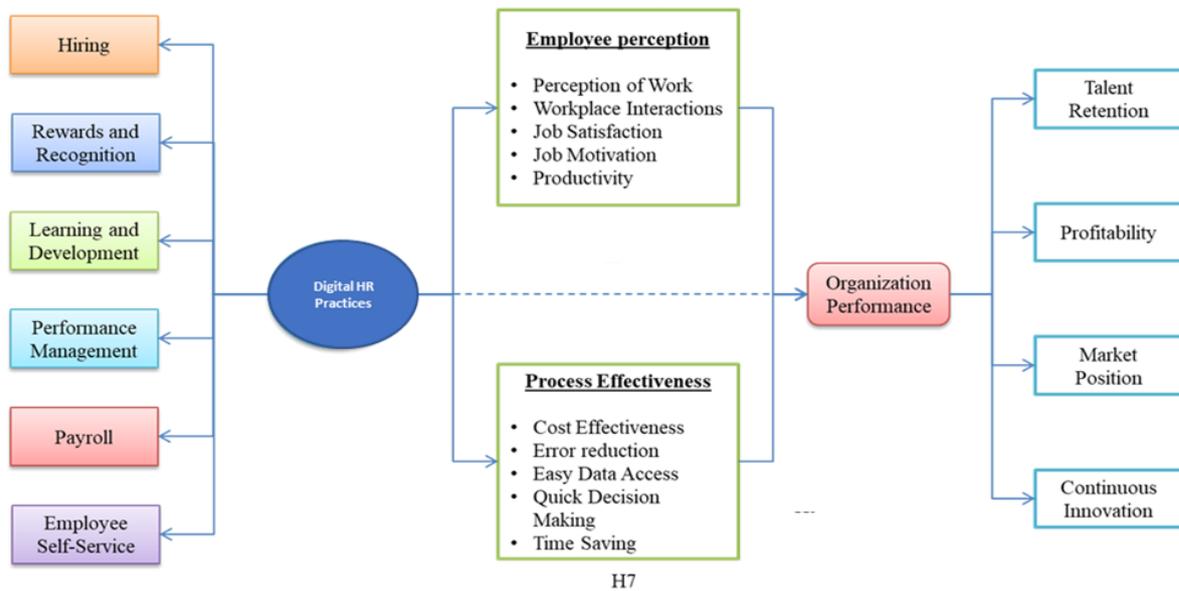


Fig 2: Digital HR Process Model

Benefits of Digital HR Practices for IT Sector

The accompanying advantages are obtained from the framework: High speed of recovery and organizing of data, Reduction in duplication of endeavors prompting diminished cost, Better investigation prompting more powerful choice making, more valid information, Better work culture, Improved nature of reports, Establishing of streamlined and orderly procedures, More lucidity in the system, To survive and to be fruitful, an association needs to hold its upper hand through Digital HR Practices. Digital HR Practices is an instrument to get required data. Data identified with human asset and their aggressiveness gives included advantage of legitimate sending of labor. Digital HR Practices helps HR Manager to take right choice based on status– quo of the association. It is useful to lessen vulnerability of association about some future occasion or state.

Conclusion

Digital HR Practices frames combination between Human Capital Management (HCM) and Information Technology (IT). It's an entire arrangement programming for information passage, information following and information data required by Human Resource works inside the association. Digital HR Practices speeds up the data gathering process, as well as more vitally, it arranges for HR office to center on more vital exercises and help the change of HCM into SHCM. This research endeavors to investigate the degree of utilization of Digital HR Practices by associations in India and to distinguish the sort of advantages they are achieving by its usage. In any case, the key aim of this study is to experimentally investigate the effect of Digital HR Practices on SHCM, so the associations can be persuaded to utilize Digital HR Practices for investigation reason to change their HCM to Strategic HCM.

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Experimental Study On Manufacturing Fired Clay Brick Using Fly Ash and M-Sand

S. Binil Sundar*

Abstract

At present construction usage of clay brick is increased rapidly. For this fired clay brick the various properties of fly ash bricks with different materials like fly ash and M sand were tested. In this paper the properties being studied on water absorption, hardness, efflorescence, soundness, shape and size, crushing strength and basic compressive strength of the prism were using different mortar mixes normally at ratio of 1: 3, 1: 4 and 1: 5 cement-sand mortars. In general bricks are made by top fertile agricultural soil but by using fly ash, 28 percent of top fertile agricultural soil is saved. Use of fly ash in brick making also is beneficial in diverse ways. This paper proves as it is compared to conventional clay bricks fly ash bricks are stronger, more durable and yet more economical. Also, the process of fly ash brick manufacturing results in lesser pollution. Being less permeable as compared to clay bricks dampness related issues are far lesser in case of fly ash bricks than their clayey counterparts.

Keywords: Brick manufacturing, fly ash, mortar mixes, cement sand mortars.

1. Introduction

Objective of the Project

Now 180 billion tones of common burnt clay bricks are consumed annually approximately 340 billion tones of clay- about 5000 acres of top layer of soil dug out for bricks manufacture, soil erosion, emission from coal burning or fire woods which causes deforestation are the serious problems posed by brick industry. The above problems can be reduced some extent by using fly ash bricks in dwelling units. So to conserve these existing recourses fly ash and M-sand is added as replacement in fired clay bricks.

Fly Ash

Thermal power plant produces a large amount of waste mainly in the form of powder which consists of useful chemicals. These chemicals play a key role as a raw material in many construction materials. So the main objective of the project is to utilize the Fly ash waste in various construction materials such as brick, concrete...etc. Fly ash waste is added in such a way that it should not loss in its properties and hence to protect the environment from pollution.

In India alone, we produce about 75 million tons of fly ash per year, but our utilization of fly ash is only about 5% of the production. Therefore use of fly ash must be popularised for more than one reason. The disposal of which has become a serious environmental problem. The effective utilization of fly ash in building material is therefore, attracting serious considerations of technologists and government departments.

M-Sand

All along in India we have been using natural sand. Availability of natural sand is getting depicted. The crusher dust, amounting to 25% of the coarse aggregates produced in stone

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crushers which were considered to be waste material facing the solid waste disposal problem, is being experimented as an alternate to Clay soil for brick and in some construction work.

Crusher dust considered to be a solid waste material posing a serious disposal problem is utilized as full replacement material for sand in brick masonry works. Further, the micro fines below 150 micron size, presenting in the crusher dust are removed by sieving and micro fine free crusher dust is used as the alternative to sand.

So Far M-Sand has not been used much in India for the reason that ordinarily crushed sand is flaky badly graded rough textured? For the last about 4 to 5 years the old methods of manufacturing ordinary crushed sand are been replaced by modern crushers specially designed for producing, cubical comparatively smooth textured, well graded sand good enough to replace clay soil.

TABLE 1.1: Grading pattern of M-Sand

I.S. SIEVE mm	PERCENTAGE PASSING		REMARKS	
	AS PER ACTUAL TEST	IS REQUIREMENTS FOR ZONE I		ZONE II
10	100	100	100	
4.75	97.58	90-100	90-100	
2.36	82.36	60-95	75-100	
1.18	55.27	30-70	55-90	FALLING IN
600	40.56	15-34	35-59	ZONE II
300	29.33	5-20	8-30	
150	18.78	0-20	0-20	
75	10.09	MAX 15	MAX 15	

2.1 Characteristics of Fly Ash

The chemical and physical properties of fly ash depend upon many parameters such as coal quality, type of coal pulverization and combustion process followed nature of ash collection and disposal technique adopted, etc.

2.2 physical Properties

Fly ash is generally gray in colour, abrasive, acidic (in some cases it may be alkaline depending upon the characteristics of the coal) and refractory in nature. Its specific surface area varies between 4,000 and 10,000 cm²/g, which is more than cement, which has a specific surface area of about 3,000 to 3,500 cm²/g. morphologically; flash consists of 3 types of particles – irregularly shaped particles, solid spheres and cenospheres. The fly ash particles range in size from about 115 microns to about 5 microns. It has unburnt carbon, cinders; minerals etc. and have pozzolanic characteristics.

2.3 Chemical Composition

Fly ash is known to consist of small spheres of glass of complex chemical composition and crystalline constituents, which are mainly quartz (SiO₂), mullite (3Al₂O₃.2SiO₂), magnetite (Fe₃O₄) and haematite (Fe₂O₃). Except Neyveli flyash, which is high in CaO (5.0 - 16.0 %) and MgO contents (1.5 – 5.0 %) and low in SiO₂ content (45.0 – 59.0 %), the range of chemical composition of Indian fly ashes is given in Table 2 along with corresponding data for British and American fly ashes.

TABLE 2.1: Chemical composition of fly ash

COMPOSITION	INDIAN FLY ASH	BRITISH FLY ASH	AMERICAN FLY ASH	GERMAN FLY ASH
Silica as SiO ₂	45 – 65.25	41.5 – 47.8	35 – 52	42.0 - 56.0
Alumina as Al ₂ O ₃	14 – 31.10	26.4 – 29	15 - 32	24.0 - 33.0
Iron Oxide as Fe ₂ O ₃	3 – 15.0	9.1 – 13.9	8 - 25	5.4 - 13.0
Calcium Oxide as CaO	0.1 – 6.5	4.2 – 5.3	0.7 – 8.0	0.6 - 8.3
Magnesium Oxide as MgO	0.2 – 3.9	1.5 – 1.9	0.3 – 1.5	0.6 - 4.3
Sulphur as SO ₃	0.4 – 1.8	0.7 – 1.7	0.1 – 2.8	0.1 - 1.9
Loss on Ignition (LOI)	1 – 11.3	1.7 – 7.3	1.3 – 13.0	0.8 - 5.8

From the above data it can be seen that Indian fly ashes are more siliceous and contain higher percentage of unburnt carbon as compared to American / German / British fly ashes.

3. The Composition of Brick

It is evident that Fly ash and M-Sand waste have the essential raw material that a brick should be made. The following chemicals should present in the brick to get a quality brick

Alumina: It is the chief constituent of clay. A good brick should have 20-30 percent of alumina. This imparts plasticity to the earth.

Silica: It exists in a free or combined form. A good brick earth should contain 50-60 percent of silica. The presence of silica prevents cracking, shrinking, and warping of raw bricks. It imparts uniform shape to the bricks. The durability of the brick depends upon the proper proportion of silica.

Lime: Up to 50 percent of lime is desirable in good brick earth. It prevents shrinkage in raw bricks. Sand alone is infusible, but it fuses at furnace temperature due to the presence of lime. Brick may melt and lose their shape due to excess of lime content.

Oxides of iron: This gives the red colour to bricks. A small quantity of iron oxide up to 5-6 percent is desirable.

Magnesia: This imparts yellow tints to brick and it reduces shrinkage.

4. Specimen Test Done On Clay, Fly Ash and M-Sand

4.1 Particle Distribution

Formula used:

$$1. \text{ Cumulative \% of retain} = \frac{\text{cumulative weight}}{\text{Total weight}}$$

$$2. \text{ \% of finer} = 100 - \text{cumulative percentage.}$$

Procedure

- Take the given dry soil of weight 1000 gm.
- Place the sieve as per the order in the sieve with empty pan at the bottom.
- Pour the soil into the given sieve set and fix the sieve set in sieving.
- Allow it to vibrate for 10 mins.
- Calculate the cumulative % retained and % of finer.

Tabulation

TABLE 4.1: Particle distribution of clay, fly ash and M-Sand

IS SIEVE SIZE	WEIGHT RETAINED(gm)		
	CLAY	FLY ASH	M-SAND
4.75	0	-	-
2.36	20	-	-
1.18	50	-	-
0.6	90	-	-
0.425	130	-	-
0.3	110	-	-
0.15	400	8	4
0.075	150	23	46
PAN	50	70	50

TABLE 4.2: Particle distribution of clay

IS SIEVE SIZE	WEIGHT RETAINED(gm)	% OF WEIGHT RETAINED	CUMULATIVE PERCENTAGE OF RETAINED	% OF FINER
4.75	0	0	0	100
2.36	20	2	2	98
1.18	50	5	7	93
0.6	90	9	16	84
0.425	130	13	29	71
0.3	110	11	40	60
0.15	400	40	80	20
0.075	150	15	95	5
Pan	50	5	100	0

4.2 Specific GRAVITY

Formula used

$$G = \frac{w_2 - w_1}{(w_2 - w_1) - (w_3 - w_4)}$$

$$(w_2 - w_1) - (w_3 - w_4)$$

TABLE 4.3: Specific Gravity of Clay, M-Sand and Fly ash

SPECIMEN	SPECIFIC GRAVITY
Clay	2.44
M-Sand	2.10
Fly ash	2.08

5. Different Phases in Brick Manufacturing

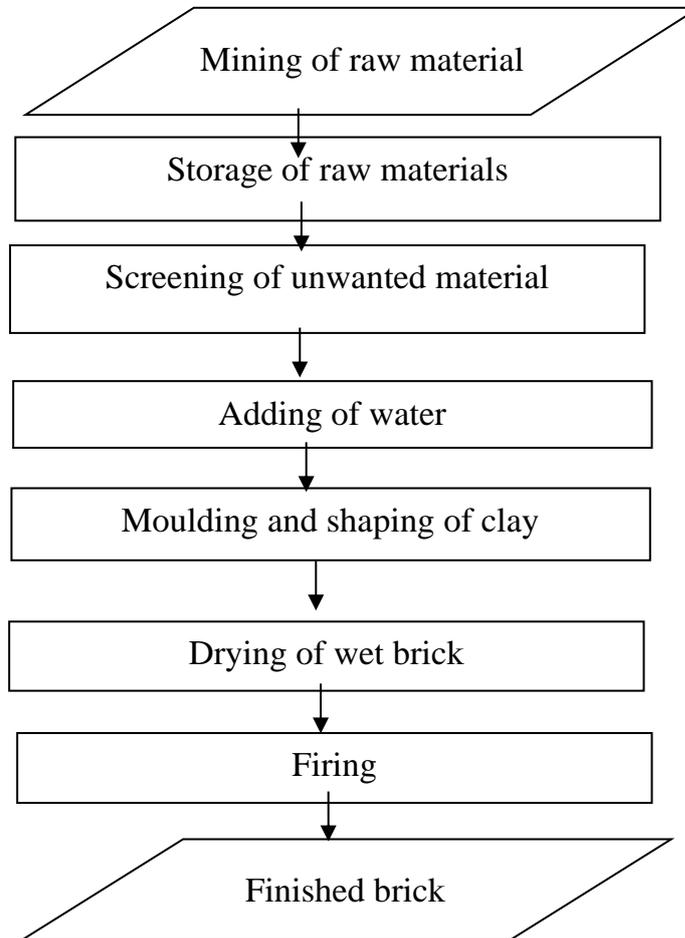


CHART 5.1: Different phases in brick manufacturing

6. Procedure Involved in Manufacturing Of brick With Fly Ash, M-Sand

Input: The raw material necessary for manufacturing of brick was collected near the thennilai area.



FIGURE 6.1: Raw material for brick

Screening of unwanted materials: Usually clay is the naturally occurring raw material, so it consists of many unwanted materials such as plant roots, stones of various sizes. This should be removed in order to get the quality brick.

Mixing of Fly Ash and M-Sand (On separate bricks): The Material arising from the Thermal power plant was to be in power manner

Mixing of clay with Materials in various proportions: As said earlier a brick needs approximately 4 kg (4000g) of raw materials. The material should be added in different levels so that when testing of brick, we would arrive at a conclusion, at what proposition the brick shows good strength without losing its properties.

Fly ash is mixed in three different ratios such as 20%, 30%, 40%.

M-Sand in single ratio 20% and remaining sand respectively, the following tabular column would explain the procedure of adding Material...

7. Test Methods to Ensure the Quality of Bricks as Per BIS

The Material added bricks should be tested to know the quality of bricks. Bureau of Indian standards prescribe some standard tests to ensure the quality of the brick. It comes under the title of "Indian standard common burnt clay bricks-specification" (fifth revision). Standard no- IS1077:1992

Scope of this standard: This standard lays down requirements for general quality, physical requirements of common burnt clay building bricks.

General quality: As per this standard it lays down some requirements for quality

- Bricks shall be hand moulded or machine moulded and shall be made from suitable soils.
- They shall be free from flaws, cracks and nodules of free time.

7.1 Physical Requirements:

7.1.1 Compressive Strength Test: The bricks when tested in accordance with the procedure lay in IS 3495(part 1):1992 shall have a minimum average compressive strength of 3.5 N/mm² or 35 Kgf/cm². The compressive strength of any individual brick tested shall not follow the minimum compressive strength specified.

Formula: $\sigma = F/A$.

7.1.2 Water Absorption Test: The bricks, when tested in accordance with the procedure lay down in IS 3495(part 2):1992, after immersion in cold water for 24 hours, water absorption shall not be more than 20 percent by weight.

Formula

$$\% \text{ of water absorption} = \frac{(\text{Wet weight of the brick} - \text{dry weight of the brick}) * 100}{\text{Dry weight of the brick}}$$

7.2 Details of the Bricks

7.2.1 Weight of the bricks: This table shows the weight of waste incorporated brick

TABLE 7.1: Weight of bricks

REPLACEMENT	CLAY(kg)	FLY ASH(kg)	M-SAND(kg)	TOTAL (kg)
20% OF FLY ASH(5 bricks)	16	4	-	20
30% OF FLY ASH(5 bricks)	14	6	-	20
40% OF FLY ASH(5 bricks)	12	8	-	20
20% OF M-SAND(5 bricks)	16	-	4	20

7.2.2 Number of Bricks Made For Testing

For compression strength test: The following table shows the no of brick made for compression strength test

TABLE 7.2: Number of bricks for compressive strength test

TYPE OF BRICK	NO OF BRICKS MADE
Raw brick	2
20% OF FLY ASH	2
30% OF FLY ASH	2
40% OF FLY ASH	2
20% OF M-SAND	2
Total no of bricks	10

7.2.3 WATER ABSORPTION TEST: The following table shows the no of brick made for water absorption test

TABLE 7.3: Number of bricks for water absorption test

TYPE OF BRICK	NO OF BRICKS MADE
Raw brick	2
20% OF FLY ASH	2
30% OF FLY ASH	2
40% OF FLY ASH	2
20% OF M-SAND	2
Total no of bricks	10

7.3 Compression Strength Test Results Of Brick: The value of the compression strength should not be lesser than 3.5 N /mm²

Dimensions of brick: The following table gives the details about the dimensions of the brick

TABLE 7.4: Dimensions of bricks

TYPE OF BRICK:	BRICK NO.	LENGTH IN (mm)	BREADTH IN (mm)	DEPTH IN (mm)	AREA IN mm ² .
Raw brick	1	215	98	82	21070
	2	218	95	85	26710
20 % fly ash incorporated brick.	3	200	89	81	17800
	4	198	91	81	18018
30 % fly ash incorporated brick.	5	202	92	80	18584
	6	201	92	85	18492
40 % fly ash incorporated brick	7	192	93	83	17856
	8	195	91	85	17745
20 % M-Sand incorporated brick.	9	197	94	82	18518
	10	198	95	80	18810

7.4 Water Absorption Test Result for Brick

7.4.1 Initial Weight of The Brick: This table shows the weight of waste incorporated brick

TABLE 7.6: Initial weight of bricks

TYPE OF BRICK:	BRICK NO.	WEIGHT OF THE BRICK IN kg
Raw brick	1	3.34
	2	3.39
20 % fly ash incorporated brick.	3	2.930
	4	3.050
30 % fly ash incorporated brick.	5	2.740
	6	2.905
40 % fly ash incorporated brick	7	3.03
	8	3.154
20 % M-Sand incorporated brick.	9	2.810
	10	2.91

7.4.2 Increase in Weight Percentage: This table gives the increase in weight percentage of the waste incorporated brick

TABLE 7.7: Increase in brick weight

TYPE OF BRICK:	BRICK NO.	INITIAL WEIGHT OF THE BRICK IN KG. A	WEIGHT OF THE BRICK AFTER IMMERSING IN WATER AFTER THE PERIOD OF 24 HRS IN KG. B	INCREASE IN WEIGHT PERCENTAGE IS GIVEN BY (B-A)/A * 100
Raw brick	1	2.78	3.34	20.14
	2	2.825	3.39	20
20 % fly ash incorporated brick.	3	2.6	2.930	12.69
	4	2.7	3.050	12.96
30 % fly ash incorporated brick.	5	2.41	2.740	13.69
	6	2.6	2.905	11.73
40 % fly ash incorporated brick	7	2.67	3.03	13.48
	8	2.85	3.154	10.6
20 % M-Sand incorporated brick.	9	2.49	2.810	12.8
	10	2.77	2.91	5.05

7.5 Result and Discussion

It is found that 40% fly ash waste added brick possess the 5.32 N/mm² compressive strength and 13.48% water absorption. This value satisfies the BIS standard data hence no loss in its properties. The test result shows the 40 % waste incorporated brick possess the value of 5.32N/mm² having the good margin from the 3.5 N/mm² so using the 40 % fly ash

waste incorporated brick will be good enough to use in the construction. The test results shows 20 % M-Sand waste incorporated brick shows the marginal value when it is compared to the raw brick and 40 % fly ash waste incorporated brick. It has the average value of 3.8 N/ mm². The test results of 30 % fly ash waste incorporated bricks shows the less value such as average value of 4.42 N/ mm² when it is compared to the raw and 40 % fly ash waste incorporated brick.

The both 50% and more fly ash waste incorporated bricks not suitable for conducting the test hence it indirectly says these waste incorporated brick won't be useful for using in construction. The water absorption test results of raw and 40% fly ash waste incorporated brick have the value of 10.985 and 13.48 % of its total weight. While 20% of M-Sand waste incorporated brick shows the value of 12.8 %. The 30 % waste incorporated brick have the water absorption value of more than 20% though it posses the compressive strength value of more than 3.5 N.mm². Hence 30 % waste incorporated wont acts as supportive material for construction.

8. Conclusion

The waste incorporated bricks were tested as per the Bureau of Indian standard (BIS) prescribed, the results were taken for analyze the behaviour of the waste incorporated bricks.

It is evident that a good brick should possess the value of 3.5 N/ mm² compressive strength and its percentage of water absorbed should not be more than 20 percent of its weight as per BIS.

Hence in combination of two results the best suitable value for adding waste in construction products will be 40%. Though 30% fly ash waste incorporated brick have compressive strength value greater than 3.5N/mm², it fails in water absorption test (possess greater than the 20% increase in weight).

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Ethiopian Trade Balance:- An ARDL Approach

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Abstract

Trade balance is one core component of gross domestic products of countries especially in the present times in which every nation have liberalization of their economies. For instance Ethiopia is running with a negative trade balance for the last three decades implying that export of the country could not cover the import expenditure. This study tries to identify the main determinants of the trade balance in Ethiopia from 1981-2017 by considering ratio of export and import as an approximation to trade balance. The Autoregressive Distributed Lag under Bounds test approach to co-integration was used for the estimation. Further, the study employed the variance decomposition and impulse response functions to investigate the dynamic simulations of the variables included in the estimated model. The results show evidence of an equilibrium long-run relationship (co integration) between trade balance, real effective exchange rate, trade openness, money supply, government consumption expenditure, household consumption expenditure and agricultural growth rate. The study finds that in the long-run increasing levels of real effective exchange rate (depreciation of birr), money supply, government consumption expenditure and household consumption expenditure worsens Ethiopia's trade balance. Trade openness and agricultural growth rate were insignificant in the long-run. The short-run result also shows that real effective exchange rate and household consumption expenditure cause a decline trade balance whilst trade openness improve trade balance in Ethiopia at 10% level of significant. Money supply and agricultural growth rate were insignificant in the short-run. The long-run and short-run effects of exchange rate on the trade balance show the absence of the Marshall-Lerner condition and the J-curve effect in Ethiopia. Further the variance decomposition results show that innovations in trade openness highly contributed to the forecast error of Ethiopia's trade balance as compared to other explanatory variables.

Keywords:- Trade ; Bound Test ; Ardl ; Co integration ; IRF.

1. Introduction

In the recent year, international trade becomes more important in every economy and there are many problems that all the multinational enterprises must face. Deep rooted structural problems, weak policy frameworks and institutions, protection at home and abroad (IMF and World Bank, 2001), and the structure of African exports, which is characterized by dependence on primary commodities (UNCTAD, 2008) are considered as the reasons for Africa's poor export performance. Moreover, after the downfall of the Dreg regime, the transitional Government of Ethiopia stated that it is essential to increase and diversify exports. In response to the problem, Ethiopia has taken different measures such as export financing incentive schemes, export trade duty incentive scheme and duty free importation

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scheme to those wholly, engaged in supplying their products to foreign markets (Yishak, 2009).

Generally, even if different trade strategies have been used in the past, including import replacement/protection for infant Industries during the Imperial period, state-managed trade during the military government era, and a more market-oriented liberalized approach supported by much trade-related technical assistance in the most recent period. Nonetheless, Ethiopia has a low share of trade in GDP, its exports continue to have limited diversification, and its trade deficit has widened significantly, leaving the country dependent on financial assistance to pay its import bill (Ciurak and Previle, 2010).

Therefore, Ethiopia's trade balance with its major trading partners calls for concern because such a wide and growing gap between the value of exports and imports of a country means that the country continues to need other sources of financing to its import demand such as foreign aid and credit; and needs these sources at an increasing rate (MOFA, 2007).

Ethiopia is among the least developed countries where the economy is primarily agriculture based and quite backward. The rudimentary stage of industrial growth combined with the traditional style of farming force the people to depend on the gifts of nature for their livelihood and the country has chronically run a negative balance of trade, rendering the country dependent upon foreign aid and loans to finance imports. Ethiopia suffers from a disproportionate loss of revenue and resultant dependence on its trade links with the rich nations due to the country is a producer of primary products, used as raw materials in the industries of rich nations and for which it is paid very poorly.

Limited diversification on export to finance imports becomes stable through time and in contrast its import sharply increased over time. Ethiopian trade deficit is highly widened after 1993 and increase sharply through time as shown in the figure.

The Ethiopian Foreign trade sector is unable to play most of its major role in the development process of the country. This study, therefore, intended to deal with those factors that determine the countries trade balance.

2. Objective of the study

To investigate the relationships between Ethiopian trade balance and its Macro-economic determinants

To investigate how Ethiopian's trade balance responds to innovations (shocks) in its determinants.

3. Review of Literature

Rose and Yellen (1989) investigate the J-curve hypothesis on both bilateral and aggregate American data using co-integration techniques and find no statistical reliable evidence of the hypothesis. Their study employs the co-integration analysis on quarterly data from the US and other OECD countries spanning from 1960:1 to 1985:3.

Using co-integration techniques on monthly data spanning from 1974 to 1986, Rose (1991) investigates the empirical relationship between real exchange rate and real aggregated trade balance for five major Organization for Economic Cooperation and Development (OECD) countries (UK, Canada, Germany, Japan, and US) and finds that, exchange rate is a statistically significant determinant of trade balance. The study further finds evidence of the Marshall-Lerner condition.

Mohammad (2010) explores the principal factors of Pakistan's trade balance using the Johansen co integration approach and error correction model during 1975 to 2008 and

found that, foreign income, foreign direct investment, inflation, domestic household consumption and real effective exchange rate significantly affect Pakistan's trade balance. More specifically, the researcher found that foreign income, foreign direct investment and exchange rate had a positive effect on trade balance in Pakistan whereas inflation and domestic household consumption impacted negatively in the long-run. In the short-run, except for foreign income and inflation, all other variables had similar results as in the long-run. Foreign income had a negative but insignificant relationship with trade balance whilst the coefficient of inflation was positive but insignificant in the short-run.

Nienga (2010) investigated the determinants of trade balance from 1920 to 2010 in Kenya. He proposed that, real exchange rate, government consumption expenditure, domestic income and money supply (M3) were the main significant factors affecting Kenya's trade balance. The researcher employed OLS and found that real exchange rate and domestic income had a positive effect on Kenya's trade balance whilst government consumption expenditure and money supply had a negative effect.

Petrovic and Gligoric (2010) employs both the Johansen co-integration and ARDL approach to co-integration to investigate the impact of exchange rate on trade balance over the period 1980 to 2008 in Serbia. The results showed that in the long-run exchange rate depreciation improves the trade balance in Serbia and further confirms the J-curve pattern in the short-run and long-run results.

Korap et al (2011) using ARDL bounds testing estimation techniques on data spanning from 1990:Q1-2007:Q3 in Turkey found that, as real exchange rate depreciate it improves the Turkish trade balance. The study further found that trade balance is negatively affected by domestic real income and positively affected by foreign income in the long-run. The researchers further observed that, there was no significant effect of crude oil prices on trade balance in the case of Turkey. In the short-run, foreign income was found to have a negative but insignificant relationship with trade balance.

Sarbapiya (2012) employs various econometric techniques and tools including Augmented Dickey-Fuller (ADF), Johansen co-integration, vector error correction models (VECM) and OLS to observe the long and short run trade behaviour for India over the period of 1973 to 2011. The results of the analysis suggest that there is a long run as well as short run causality among inflation, exchange rate, FDI, household consumption and foreign income. Foreign income and FDI had a significant positive impact on balance of trade whilst household consumption and inflation and exchange rate impacted negatively on the balance of trade in the long-run. The short-run results were found to be similar to that of the long-run.

Shawa and Shen (2013) by employing the OLS estimator on data from a period of 1980 to 2012, finds that the main influencing factors of Tanzania's trade balance include, foreign direct investment, human capital development, real exchange rate, household consumption expenditure, government consumption, inflation, natural resource availability, foreign income and trade liberalization. The study found that household consumption expenditure, government consumption expenditure, inflation and real exchange rate had a negative effect on trade balance, hence causing deterioration while foreign direct investment, human capital development, natural resource availability, foreign income and trade liberalization had a positive effect, hence improving Tanzania's trade balance.

Kayhan et al (2013) using quarterly data for the period 1987Q1–2011Q3 employed the bootstrap process based on the Toda-Yamamoto causality and frequency domain analysis

methods and obtained a bi-directional causality between trade deficits and government expenditure in Turkey. Contrary to the Toda-Yamamoto causality analysis, the frequency domain causality analysis finds, the causality running from government expenditure to trade deficit exists in the short run or medium term whilst a causal relationship runs from trade deficit and government expenditure in both the long-run and the short-run. In light of the literature and theoretical frameworks, the study implied that, reduction in government expenditures will successfully reduce trade deficits.

Sulaiman and Abdul-Rahim (2014) tests the j-curve pattern on Thailand's trade in forest products with the rest of the world. The study employs the Bounds Test within the ARDL framework on data spanning from 1970 to 2010. The study also assesses the short-run and long-run dynamics of Thailand's trade balance and various determinants. The results of the study showed the absence of the J-curve pattern in Thailand's trade in forest products. The long-run results showed that, Thailand's national income improved its trade balance whilst, foreign income, exchange rate and forest policy caused trade balance to deteriorate. In the short-run Thailand's national income was found to have a positive and significant impact on trade balance. The impact of foreign income, exchange rate and forest policy were however statistically insignificant in the short-run.

Turkay (2014) employs the Johansen co-integration and error correction model on annual time series data spanning from 1980 to 2012 to test the validity of the Marshall-Lerner condition in Turkey. The study confirms the validity of the Marshall-Lerner condition in Turkey in the long-run. However, the short-run results show that exchange rate had an insignificant relationship with Turkey's trade balance.

Tutueanu (2015) examines the J-curve effect on international trade in Romanian forest products. The study employs the Bounds testing approach within the ARDL framework on annual time series data spanning from 1990 to 2014. The results of the study showed the absence of the j-curve pattern for the trade balance of forest products. The results further showed that in the long-run Romanian's national income and world income had a positive and significant impact on the trade balance of forest products in Romanian.

Varga (2015) analyses the impact of the agricultural sector on the employment and foreign trade balance in Hungary. The study employs descriptive analysis on data spanning from 2004 to 2014. The results showed that over the sample period, the agricultural sector was the second largest contributor to exports and has improved Hungary's trade balance year after year. Again the share of agriculture is higher in exports than in imports of Hungary, hence causing a significant improvement in Hungary's trade balance.

Gobe (2015) examine the short and long-run relationship between the trade balance, income, money supply, and real exchange rate in the case of Ethiopian economy. The bounds testing approach to co integration and error correction models, developed within an autoregressive distributed lag (ARDL) framework is applied to annual data for the period 1979/80 to 2012/13. Additionally, variance decompositions (VDCs) are used to draw further inferences. The result of the bounds test indicates that there is a stable long-run relationship between the trade balance and income, money supply, and exchange rate variables. The estimated results show that the coefficient of the real exchange rate variable is positive and statistically significant at a 10 percent level confirming the hypothesis that real depreciation succeeds in improving trade balance of Ethiopia in the long run. Similarly, The coefficients of money supply and income positive and statistically significant at 1 and 5 percent level it provides that money supply and income play a strong

role in determining the behavior of the trade balance. The error correction model result indicates all of the coefficients of variables are statistically insignificant. This implies that all variables do not affect trade balance in the short run. Based on the coefficients of the variables statistically significant level exchange rate policy can help improve the trade balance but it will have a weaker influence than economic growth and monetary policy.

Bantegizie and Dawit (2017) examine the short and long-run determinants of trade balance in the case of Ethiopia's economy for the period 1978 to 2009. In order to achieve the stated objectives a synthesis model of absorption, elasticity and monetary approaches to trade balance is estimated using Engle-Granger two step procedures of co-integration and general to specific error correction model. The findings of the study suggest that the most important long run determinants of trade balance are household consumption expenditure, real effective exchange rate and terms of trade while government consumption expenditure, house hold consumption expenditure, real effective exchange rate and terms of trade are the short run determinants of trade balance. Based on the findings of this study the researcher recommended raising import tariff on final consumer goods , expand industrial base, increase domestic saving to finance domestic investment, depreciation or devaluation of birr and improving the quality of domestic products to solve the trade imbalance.

4. Methodology

The study uses the annual (secondary) time series data covering the period between 1981-2017. This period has been chosen because data are to be used in the trade balance function that has been available. All the data have drawn from the National Bank of Ethiopia (NBE) and Ministry of Finance and Economic Development (MoFED), unless otherwise from International Financial Statistics Year Book, world development indicators (WDI), World Bank (WB) and publications and websites.

After the data has collected following the researcher analyzed by using regression method of analysis. The study adopts ARDL model in order to assess the short run and long-run relationship between the dependent and independent variables. Multiple regression analysis was also applied to test the association of among Variables and the extent of variance in the dependent variable as a result of a unit change in independent variables. Eviews-10 has been used for the analysis of the data because it is the most convenient for time series analysis than STATA and SPSS. The data is presented by using graphs and tables.

The study adopts the imperfect substitute model of international trade of Goldstein and Khan (1985), Rose and Yellen (1989) and Rose, (1991) where a reduced form of trade balance is developed.

Regarding the estimation strategy, the study follows three steps: i) the test of stationarity of the individual series in the regression model or otherwise to determine the order of integration of the variables, ii) the test of the existence of a stable long-run equilibrium relationship among the variables in the model, iii) the estimation of the parameters of the model, iv) estimating the variance decomposition and impulse response functions. and v) finally conducting the Diagnostic Tests.

5. Result Analysis

5.1 Unit Root Test

In order to ensure that there is a strong no evidence of unit root or otherwise having stationarity in individual series; the study employs the Augmented Dickey-Fuller (ADF) tests as seen in table 1.

Table. 1 Augmented Dickey-Fuller test

Variable	Stationary at Level		Stationary at First Difference	
	constant	Constant and trend	constant	Constant and trend
TB	-2.124477	-3431679	-6.201106***	-6.134624***
REER	-1.920712	-2.153650	-5.081975***	-5.058928***
GC	-2.646816	-2.729327	-4.648858***	-4.571335***
HC	-2.235597	-2.058532	-7.130497***	-7.176050***
MS	-2.681339	-4.052559	-5.350336***	-5.615103***
OP	-1.335682	-0.777317	-4.525930***	-4.585349***
AG	-5.558973***	-7.137586***	_____	_____

Not e: *** and ** denotes significance at 1% and 5% respectively

Source: *Eviews-10 calculation*

The ADF test result (see Table.1) shows that, for the model with only constant and no trend, Agricultural Growth (Ag) is integrated of order zero, at 1% level of significant thus I(0) level of significance. At first difference and with regards to the same model (constant and no trend), trade balance (TB),real effective exchange rate (REER), government consumption expenditure (GC), household consumption expenditure (HC), money supply (MS) and trade openness (OP)are integrated of order one [I(1)] at 1% level of significant.

Again, for the model with both constant and trend at the levels Ag is integrated order zero, I (0) at 1% significance level. At first difference; TB, REER, MS, GC, HC and OP are significant at 1% hence are integrated of order one, I (1). The results obtained in Augmented Dickey Fuller tests (ADF tests) show mix results in terms of the order of integration of the variables. In other words the underlying series of the variables in the study are integrated of order zero I(0) and order one I(1) hence offering support for the use of ARDL bounds test to co integration. This implies that all the variables were found to be mean reverting.

5.2. Co integration Test

The results are presented in Table .2. The ARDL model (1, 2, 3, 2, 0, 3, 3) selection was based on the akaika information criterion (AIC). The result in Table 4.2 shows that there exists a stable long-run relationship among the variables. The computed F-statistics of the bound test 4.95 is larger than the upper bound critical value of 3.96 at 5% level of significance. In this case the null hypothesis of no cointegration is rejected implying that there is a stable long-run equilibrium relationship among the variables (co integration). This implies that there is a long-run relationship among the variables included in estimated model.

Table. 2: Results of Co integration relationship (Bound test)
Critical Values

Computed F-statistic	95% Lower Bound	95% Upper Bound
4.952307**	2.69	3.96

Note: ** means that the null hypothesis of no long-run equilibrium (no co-integration) is rejected at 5% level of significance.

Source: *Eviews-10 calculation*

5.3. Long-run Relationship between Exchange rate and Trade Balances in Ethiopia

The results shown in Table.3 states that, in the long-run there is a negative relationship between exchange rate and the trade balance. This dissatisfies the a-prior expectation of the coefficient of the exchange rate variable. It shows that a one percent increase in the exchange rate (i.e. a depreciation) worsen the trade balance in the long-run. Specifically, a unit increase in the exchange rate will worsen trade balance by 0.148 units in the long-run. Even though the variable we obtain is significant, the result obtained shows a negative relationship between the exchange rate and the trade balance in the long-run result suggests the absence of the Marshall-Lerner condition. In the same way, since the long-run coefficient of the exchange rate variable negative and significant, it can be concluded that there is absence of the J-curve pattern.

In both cases neither conditions of the long-run are satisfied. This is not surprising because, Ethiopia's export sector is mainly dominated by agricultural products with a large percentage being raw materials and semi-processed products such as coffee, oilseeds, flowers and live animals and animal products, while its imports are highly dominated by capital intensive goods as well as finished goods such as petroleum products, machines and equipments. This may be attributed to the fact that export products are of low quality, and also because they are only agro-based products which have high perishability risk. Therefore currency depreciation might not necessarily cause an improvement in the country's trade balance if exports are elastic and imports are inelastic.

Table. 3 Estimated Long-run

ARDL (1, 2, 3, 2, 0, 3, 3,) selected based on AIC Dependent Variable: TB

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REER	-0.148554	0.031414	-4.728854	0.0004
OP	-0.160231	0.254950	-0.628482	0.5406
MS	-1.304498	0.244583	-5.333552	0.0001
GC	-2.489661	0.640049	-3.889794	0.0019
HC	-2.027651	0.596821	-3.397420	0.0048
AG	0.254338	0.244258	1.041266	0.3167
C	2.673099	0.475263	5.624467	0.0001

Source: *Eviews-10 calculation*

Again another reason that might contribute to the negative and significant result obtained is that though the domestic currency (Ethiopian Birr) has persistently depreciated against major trading currencies such as the Dollar, the Euro and the Pound over the years, there are still relatively high volumes of foreign goods on the domestic market. This may be attributed to various reasons including; i) most domestic producers use foreign goods as

primary inputs in their production processes; and ii) most consumers have relatively high preference for foreign goods than domestic ones.

5.4. Long-run Relationship between Macroeconomic Determinants and Trade Balance in Ethiopia

More specifically in the long-run a unit increase in the money supply causes deterioration in the trade balance by approximately 1.30 units. Again, the negative and significant result obtained is not surprising since over the years money supply has continually expanded at a measured pace (NBE, 2017).

The coefficient of household consumption expenditure has a negative and statistically significant relationship with the trade balance in the long-run confirming the a-prior expectation. That is, in the long-run a one percent increase in household consumption expenditure causes deterioration in the country's trade balance. Specifically, a unit increase in individuals' consumption expenditure causes approximately -2.03 unit deterioration in Ethiopia's trade balance at 1% level of significance. The negative relationship between the country's trade balance and household consumption expenditure is not surprising because consumption of goods comprises of both domestic and foreign products, hence an increase in the consumption expenditure of local residents increase the demand for both domestic and foreign goods.

Again, the result is strongly supported by the fact that Ethiopians have a high taste and preference for foreign goods and as such most goods found on the Ethiopian consumer shelf mainly constitutes foreign goods. Foreign products including cars, second-hand goods, petroleum product, electronic equipment and so forth dominate the domestic market. This is so because such goods are not produced locally and hence their high demand is offset by importations from foreign countries. In addition, though few of such goods are produced locally, their volumes and quality are unable to meet consumers' preferred demand, thereby causing a lot of substitution of the locally produced goods hence worsening the country's trade balance position.

Regarding the long-run coefficient of government consumption expenditure, the result shows a negative and significant relationship between government consumption expenditure and the trade balance. This implies that a one percent increase in government consumption expenditure leads to deterioration in the trade balance by approximately -2.49 units at one percent significance level in the long-run. This is consistent with a-prior expectations. Government consumption expenditure constitutes two-folds; expenditure is either on domestic goods or foreign goods. Hence an increase in government consumption expenditure may either be diverted to domestic goods or foreign goods. Again, expenditures by the government can either be diverted into productive ventures such as investing in productive sectors in order to promote exports or non-productive areas such as the purchase of luxury cars, military goods, machines and equipment, mostly not produced domestically. Therefore, deterioration in trade balance may imply that, government spends more in non-productive sectors than diverting funds into productive ventures. This might be the case considering the fact that a chunk of government consumption expenditure is diverted to the provision of inputs for public goods including road construction, health care, education and agriculture. Since these inputs for such public goods are not produced domestically, the country relies on foreign substitutes.

The coefficient of the Trade Openness indicated a negative relationship with the trade balance in the long-run but it affect insignificantly. A unit increase in Trade Openness

causes deteriorate in Ethiopia's trade balance by -0.160 units in the long-run but insignificant. Though the sign of the coefficient confirms the a-prior expected sign, this is because of as a result of free trade in Ethiopian causes imports highly industrial good which has income inelastic, but it exports agricultural products which has less income elastic. It showed that liberalization (trade openness) lead to the deterioration of the trade balance or too fast of an increase in imports.

The coefficient of the agricultural growth rate indicated a positive relationship with the trade balance in the long-run. A unit increase in the growth rate of the agricultural sector causes an improvement in Ethiopia's trade balance by 0.254 units in the long-run. Though the sign of the coefficient confirms the a-prior expected sign, the result is not statistically significant. Logically, since Ethiopian is an agrarian economy with its export sector highly dominated by agricultural products, growth in the agricultural sector should result in a significant improvement in its trade balance. The insignificance results can be attributed to the fact that as compared to other countries, the Ethiopia's agricultural sector is still at the verge or approaches of experiencing immense growth. In addition, the positive and insignificant results obtained might be because, unlike the advanced countries that indulge or satisfied in agriculture, Ethiopia's agricultural sector lacks advanced technologies and in effect causes stagnation in it growth rate.

5.5. Short-run Relationship between Macroeconomic determinants and Trade Balance in Ethiopia

The previous section has analyzed the long-run (co integration) relationship among the variables. In this section, focus is on the short-run relationship among variables. To achieve this error correction model was estimated. The results are presented in Table .4.

As shown in Table.4.The short run result shows a statistically significant negative coefficient of exchange rate to the trade balance. Specifically, a unit increase in exchange rate in the short run leads to 0.075 unit deterioration in Ethiopia's trade balance at 1% significance level. The results imply that an increase in the exchange rate leads to a deterioration of the trade balance in the short-run. The short-run result satisfies the first condition of the J-curve effect as earlier stated. The coefficients of the Lagged (REER (-1)) real effective exchange rate causes an improvement in the country's trade balance in the short run. Though the result shows an initial deterioration of the trade balance and Lagged coefficient improvement on trade balance, as the first condition needed to confirm but Lagged not confirm the theory of the J-curve effect, the long-run result earlier discussed then the result shows that the J-curve effect is not fully supported in the case of Ethiopia. Hence the absence of the J-curve effect can be concluded.

Table. 4. Estimated Short -run

ARDL (1, 2, 3, 2, 0, 3, 3,) selected based on AIC Dependent Variable: TB

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REER)	-0.075705	0.018212	-4.156775	0.0011
D(REER(-1))	0.064128	0.020322	3.155642	0.0076
D(OP)	0.391130	0.192767	2.029033	0.0634
D(OP(-1))	0.725448	0.180647	4.015824	0.0015
D(OP(-2))	-0.541610	0.166240	-3.258003	0.0062
D(MS)	-0.121704	0.154818	-0.786110	0.4459
D(MS(-1))	0.730932	0.221492	3.300039	0.0057
D(HC)	-1.378573	0.191852	-7.185601	0.0000
D(HC(-1))	0.338050	0.166378	2.031819	0.0631
D(HC(-2))	-0.341227	0.162686	-2.097459	0.0561
D(AG)	-0.064999	0.059699	-1.088780	0.2960
D(AG(-1))	-0.325910	0.070128	-4.647342	0.0005
D(AG(-2))	-0.104100	0.070707	-1.472269	0.1647
ECT(-1)*	-1.089422	0.139542	-7.807142	0.0000

Source: *Eviews-10 calculation*

The coefficient of money supply is negative and statistically insignificant to the trade balance in the short-run. Specifically, a unit increase in money supply causes Ethiopia's trade balance to fall by 0.121 units in the short run but insignificant. The result is similar to the long run results but it's insignificant and also not satisfied the monetary approach to balance of payment. The result implies that an increase in money supply tends to increase the real money balances of individuals (consumers) and as such increases their consumption paths which can either be on domestic goods and foreign goods. With the relatively high preference for foreign goods, causes a decline in the trade balance position of the country. On the contrary, the "lagged" coefficient of money supply D(MS(-1)) showed a positive and significant relationship with the trade balance.

The result shows that the short-run coefficient of household consumption expenditure is negative and statistical significance. This is consistent with the long run results discussed in the previous section. A unit increase in household consumption expenditure leads to a 1.378 unit deterioration in trade balance in the short run at 1% error level. However, the "lagged" coefficient of household consumption expenditure causes an improvement in the country's trade balance in the short run but it was insignificant in the short run. This result is maybe due of the inherent human behavior of not adjusting quickly to changes in consumption.

In terms of the coefficient of agricultural growth rate, it is negatively related to trade balance in the short run. A unit increase in agricultural growth rate leads to 0.065 unit deterioration in Ethiopia's trade balance in the short run but however statistically insignificant. The "lagged" effect of agricultural growth rate causes a decline in Ethiopia's trade balance in the short-run. Thus, a unit increase in the coefficient of the "lagged" agricultural growth variable D(AG(-1)) causes 0.326 unit deterioration in the country's trade balance in the short run at 1% significance level. This implies that a delay in the agricultural production, hence its growth rate will cause Ethiopia's trade balance to deteriorate in the short run. In other words, a decline in output of the agricultural export

sector will decrease the volumes of exports relative to imports, and hence cause a decline in the country's trade balance.

The results show that the coefficient of trade openness causes improvement on Ethiopia's trade balance. A unit increase in trade openness causes trade balance increase by 0.391 10% level of significant effect on trade balance. The "Lagged" effect of trade openness causes an improvement on Ethiopia's trade balance. A unit increase in Lagged trade openness $D(OP(-1))$ causes trade balance improve by 0.725 and it affecting trade balance significantly in the short-run. The "second Lagged" coefficient of trade openness causes a deteriorating in trade balance of Ethiopia. A unit increase in the second Lagged trade openness $D(OP(-2))$ leads a deteriorating in trade balance by -0.541 unit and it affecting trade balance significantly in the short-run.

Finally from economic intuition, the error correction term (ECT-1) in the ECM measures is the speed at which an endogenous variable adjusts to shocks in an explanatory variable in order to converge to its long run equilibrium. The estimated ECT-1 coefficient must be negative and statistically significant at one percent error level. The negative and significant coefficient of the ECT-1 confirms the cointegration results discussed in section 4.4. The ECT-1 explains the extent to which exchange rate, household consumption expenditure, government consumption expenditure, money supply, trade openness and agricultural growth rate returns to the equilibrium in the long-run after a short-run shock. The result shows a high speed of adjustment of convergence to the long run equilibrium every year after a short run shock. In other words, the coefficient -108.9 indicates high rate of convergence to equilibrium, which implies that the deviation from long-term equilibrium is corrected by 108.9 over each year.

5.6. Diagnostic and Stability Test in the Model

5.6.1. Multi-collinearity Test

Table.5 shows that multi-collinearity exists only between trade openness and real effective exchange rate. The presence of multi-collinearity was controlled by using white heteroscedasticity test to produce robust standard error but now for this model there is **no presence of multi-collinerity**.

Table. 4 Correlation Matrix's

variables	REER	OP	MS	GC	HC	AG
REER	1.0000					
OP	-0.82135	1.0000				
MS	-0.3867	0.64495	1.0000			
GC	-0.02624	-0.11548	-0.39313	1.0000		
HC	-0.21228	0.33112	-0.03135	-0.42891	1.0000	
AG	-0.19009	0.266812	0.201164	-0.14984	0.102143	1.0000

Source: *Eviews-10 calculation*

Results of long run Granger causality tests are shown in Table .6 In the long-run, the F-statistics on the explanatory variables suggest that at the 5% level or better there is no bi-directional Granger causality between any variables under consideration. However there is a long run unidirectional Granger causality running from household consumption expenditure to real effective exchange rate, trade openness to money supply, Household consumption expenditure to trade openness. However; in the short run there is unidirectional causality from Household consumption expenditure to trade openness and

government consumption expenditure to household consumption expenditure. There is no Granger causality except the one indicated above.

In order to test the statistical adequacy of the model the study conducts diagnostic and stability tests. The results presented in Table.6 shows that there is **no evidence of serial correlation or heteroskedasticity in the model**. The LM version serial correlation test result gives a co-efficient of 5.5334 and a probability value of 0.1367 hence the null hypothesis of non-existence of serial correlation is not rejected against the alternative hypothesis of existence of serial correlation. Again, the LM version heteroskedasticity test gives a coefficient value of 18.49230 and a probability value of 0.5550, hence the non-rejection of the null hypothesis of no serial correlation. The **probability values of the functional form and normality tests are 3.7548 and 0.1529 respectively, hence statistically significant. This therefore, implies that the model does not exhibit any functional or normality problems**. The CUSUM and CUSUMQ residuals line within the 5% critical value bounds implying stability in the model. Hence it can be concluded that the regression equation is stable throughout the sample period considered.

Table. 5 Results of Diagnostics and Stability test

TEST STATISTICS	RESULTS
SERIAL CORRELATION	5.5334 (0.1367)
NORMALITY	3.7548 (0.1529)
HETEROSKEDASTICITY	18.49230 (0.5550)
CUSUM	STABLE
CUSUMQ	STABLE

Source: *Eviews-10 calculation*

Note: values in parentheses are probability values

5.7. Ethiopian's trade balance responds to innovations (shocks)

From an estimated VAR model and in order to convey a sense of dynamics, Table .7 presents the VDF of the variables in a ten year horizon. From a quick look at the results presented in Table 4.7, it is evident that within the ten year horizon, the forecast error variance of trade balance is a result of its own shocks. In the first horizon, the result shows that, 100% of its forecast error variance is attributed to its own shocks. However, by period 2 through to period 7, innovations contributed 93.32%, 56.85%, 49.39%, 48.64%, 47.30% and 44.72% respectively to its forecast error variance. By eighth, ninth and tenth horizon the innovations from trade balance contributed 42.14%, 39.65% and 37.70% respectively to its forecast error variance. This implies that within the sample period, changes in Ethiopia's trade balance were high as a result of shocks in exports and imports of goods and services.

In terms of innovations in the explanatory variables, innovations in trade openness contributed the most to the forecast error variance of trade balance as compared to the other variables over the horizon. In the same way innovations in money supply, household consumption expenditure, real effective exchange rate, government consumption expenditure and agricultural growth rate contributed sequentially to the forecast error variance of trade balance over the specified time horizon.

Table. 6. Variance Decomposition Result

Innovation (Shocks) of TB

% of Forecast Variance Explained by Innovation in

Period	TB	REER	OP	MS	HC	GC	AG
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	93.32657	1.974770	0.009249	0.169287	0.001636	2.931957	1.586532
3	56.85514	7.970699	14.62990	11.59080	0.070022	7.531108	1.352332
4	49.39227	6.558163	22.34330	10.98922	1.405912	8.163067	1.148072
5	48.64420	6.974518	22.51926	11.57366	1.328040	7.377508	1.582821
6	47.30154	10.28003	20.95274	11.62784	1.349943	6.969014	1.518889
7	44.72323	12.23957	19.79916	11.69517	3.089514	6.735433	1.717913
8	42.14196	12.44672	18.42152	12.14663	6.933232	6.312001	1.597936
9	39.65488	12.05497	17.05161	12.79422	10.98753	5.842070	1.614722
10	37.70913	11.86377	16.10601	13.26318	13.91585	5.579463	1.562602

Cholesky Ordering: TB REER OP MS HC GC AG

Source: *Eviews-10 calculation*

The results show that first period innovations in **trade openness** contributed 0.0% of the forecast error variance of trade balance. The explanatory power of trade openness however increased over increasing time horizons. Specifically, from the second through to the fifth horizon, the contributions of innovations in trade openness to the forecast error variance of trade balance gradually rise to 0.009%, to 14.63%, to 22.34% and to 22.51% respectively. Again, by the sixth up to ten horizons, innovations slightly decreased to 20.95%, 19.79%, 18.12%, 17.05%, and 16.10% respectively. This implies that in terms of the explanatory variables included in the study, trade openness was a **major contributor** to trends in Ethiopia's trade balance over the sample period.

Shocks in **money supply** contributed 0.0% to the forecast error variance in the first period and gradually increased to 0.16% and 11.59% by the second and third period respectively. But in the fourth period its contribution decrease to 10.98%. From the fifth to tenth periods innovations in money supply gradually increase its contribution 11.54%, 11.62%, 11.69%, 12.14%, 12.79% and 13.26% respectively. This implies that in terms of the explanatory variables included in the study, money supply was second **major contributor** to trends in Ethiopia's trade balance over the sample period.

Again the innovation from household consumption expenditure to forecast error variance in the first period was 0.0%, but its contribution gradually increased from period two to period four those are 0.0016%, 0.070% and 1.406% respectively, however its contribution decline in period five to 1.328% but from period six to period ten there is an improvement innovation of household consumption expenditure from 1.35%, 3.09%, 6.93%, 10.98% and 13.91% respectively. After period seven the contribution of household consumption expenditures innovation to trade balance become increases this shows that it's one of the **major factor** affecting Ethiopia's trend of trade balance on the sample period.

Though in period 1, innovations in the real effective exchange rate contributed only 0.0%, as compared to the other variables over the sample period it was the fourth highest contributor to the forecast error variance of trade balance in Ethiopia. Its innovations contributed 1.97% and 7.97% to the forecast error variance of trade balance by the second and third period. However in period 4, the contribution decreases to 6.55%. But in period 5, period 6, period 7 and period 8, the contributions of innovations in real effective exchange rate were increases from 6.97%, 10.28%, 12.24% and 12.44% respectively. By

the ninth period and tenth period, shocks in real effective exchange rate **contribution** decreases to 12.05% and 11.86% respectively to the forecast error variance of trade balance.

Innovations from government consumption expenditure contributed to the forecast error variance of trade balance in the model 0.0% in the first period. But in the second, third and fourth period innovation from government consumption expenditure increases from 2.93%, 7.53% and 8.16% respectively to the forecast error variance of trade balance. However there was a gradual decrease in innovation by government consumption expenditure from fives to tenth periods these are 7.37%, 6.97%, 6.73%, 6.31%, 5.84% and 5.58% respectively to the forecast error variance of trade balance. This implies that the **contribution** of government consumption expenditure to the forecast error variance of trade balance gradually decline overtimes within the sample periods.

Shocks in agricultural growth rate **contributed** little to the forecast error variance of trade balance. From the results, it is evident that its innovations contributed 0.0 % in the first period and slightly increase to 1.586% by the second period. In the third and fourth periods its innovations contribution decline 1.35% and 1.15% respectively. However in fives period there is improvement on its innovation to 1.582%, but the contributions of innovations decreased to 1.52% in the sixth period. The contribution also increase in period seventh to 1.717%, but it decline in eighth to 1.58%. The contribution of innovation from agricultural growth rate increase in period ninth to 1.61% but its contribution decline to 1.58% in period tenth. Innovations from agricultural growth rate had little and volatile effect on changes in Ethiopia's trade balance over the sample period.

From the above explanations, it is clear that the VDF substantiate that the significant role played by trade openness, money supply, household consumption expenditure, real effective exchange rate, government consumption expenditure and agricultural growth rate in accounting for fluctuations in forecast error variance of Ethiopia's trade balance over the time horizon within the sample period considered. In terms of explanatory power, innovations in agricultural growth rate explained very little of the forecast error variance of trade balance as compared to other variables. The implication is that **agricultural growth rate contributed very little to trends in Ethiopia's trade balance over the sample period.** Nevertheless the portion of trade balance variations accounted for by most of the explanatory variables increased continuously over the time horizon of which the percentage of forecast error variance in trade balance is highly accounted for by innovations in trade openness followed by money supply as it maintains the highest percentage than the other variables. This also implies that **changes in the country's trade balance are highly attributed to shocks from trade openness and money supply.**

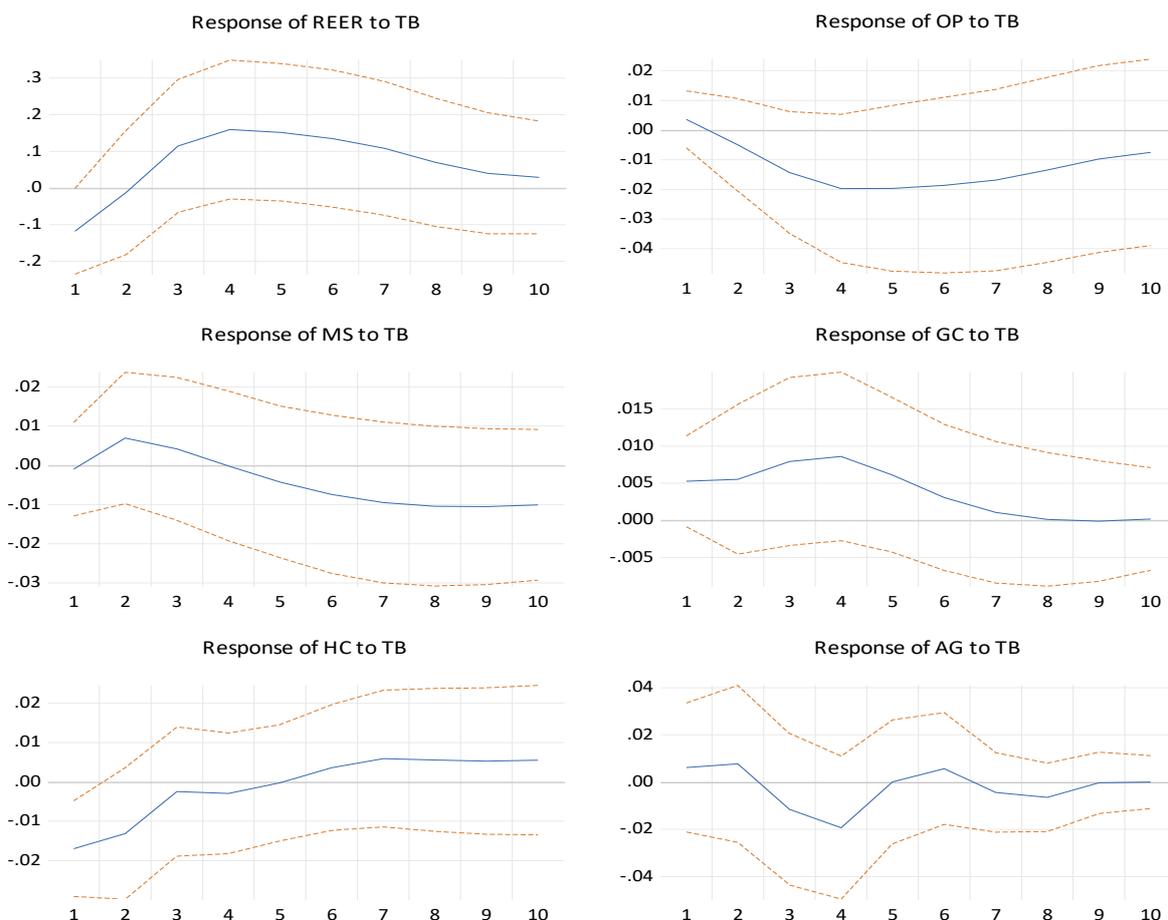
The results of the IRF are presented. Figure 1 showing the plots of the generalized IRF of trade balance with respect to innovations in exchange rate, trade openness, money supply, household consumption expenditure, government consumption expenditure and agricultural growth rate within a ten-year horizon. This approach reveals insight into the dynamic relationships between the variables as it portrays the response of a variable to an unexpected shock in another variable over a specified time horizon. The horizontal axis in each graph shows the number of years after the impulse has been initialized while the vertical axis shows the responses of the appropriate variable.

As evidenced in the first plane of figure 1 innovations from real effective exchange rate caused an improvement in trade balance from period 1 to period 4, but start from period 4

to period 6 there is slight decline on trade balance and From period 6 to period 10 there real effective exchange rate causes worsening of trade balance in Ethiopia. This might explain why the long-run impact of exchange rate, though negative and significant and also a clear indication why the J-curve effect is not fully satisfied statistically.

Figure 1. Impulse Response Function

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.



Source: *Eviews-10 calculation.*

The response of trade balance to shocks in trade openness is shown in the Figure 1 above. From period 1 to 4 periods, innovations from trade openness caused a worsening in the trade balance position. From period 4 to period 5 the trade balance highly stable and from period 5 to 10 the shocks from trade openness causes improvement on trade balance in Ethiopia. Innovation in trade openness caused an improvement in trade balance position in Ethiopia on the sample period.

The third plane in Figure 1 shows the **response of trade balance to innovations in money supply**. From period 1 to period 2, innovations caused improvement in the trade balance position but from period 2 to period 7 there was a worsening in trade balance position. From period 7, 8 and 9 innovations caused a stability in trade balance and further caused a slightly rise in period 9 to 10. From period 6 to period 10 responses of trade balance resulting from innovations in money supply was very little compared to responses occurring in period 1 to period 3.

The response of trade balance to shocks in government consumption expenditure is shown in the fourth plane of Figure 1, from period 1 to period 2 innovations in government consumption expenditure caused slight increment in the trade balance position. From period 2 to period 4 the innovations in government consumption expenditure caused an improvement in the trade balance position but trade balance position gradually decline further from period 4 to period 8. From period 8 to period 10, innovations in government consumption expenditure caused a slightly stable in the trade balance position.

Figure 1 of plane five shows that the innovations in household consumption expenditure caused improvement in trade balance position from period 1 to period 3 and from period 3 to 4 there is stability in trade balance position. But from period 4 to period 8 its innovation caused an improvement in the trade balance position, by period 8 to period 10 trade balance gradually became stable. Innovations from household consumption expenditure caused an improvement in the trade balance in Ethiopia on the sample period.

The last plane in Figure 1 shows the response of trade balance to innovations in agricultural growth rate. From period 1 to period 2, its innovations caused a stability in the trade balance position but from period 2 to period 4, trade balance position is worsening and further from period 4 to period 6 the innovation causes improvement on trade balance position. Though from period 6 to period 8 there was a decline in trade balance due to innovations in agricultural growth rate, from period 8 to period 9 there was rise in the trade balance. In the tenth period, the response of trade balance to shocks in agricultural growth rate was almost zero. It is evident in the sixth plane of Figure 6 that, from period 6 to period 10 the responses of the trade balance to innovations in agricultural growth rate was lesser than the responses occurring from period 2 to period 5.

6. Conclusions and Recommendations

6.1. Conclusions

The research set out to analyse the determinants of trade balance in Ethiopia from 1981-2017. In order to achieve this, the study tests for the presence or absence of the Marshall-Lerner condition and the J-curve effect. It further examines the impact of other macro-economic variables on the country's trade balance. Finally the study analyses the innovations (shock) of the variables included in the estimations. In other words, it investigates how innovations in the explanatory variables and own shocks contribute to the forecast error variance of Ethiopia trade balance and also traces the directional response of the Ethiopia trade balance to a one standard-deviation in own shocks or shocks in explanatory variables. The study employed the ARDL bounds test to co-integration as its estimation strategy. It also employs the VDF and IRF to analyse the dynamic simulations of the variables.

The study finds evidence of both long-run relationship and short-run dynamics among the variables understudy, thus trade balance, real effective exchange rate, trade openness, money supply, government consumption expenditure, household consumption expenditure and agricultural growth rate. It found the absence of the Marshall-Lerner condition and J-curve effect in Ethiopia. Again, the VDF showed that trade openness followed by money supply highly contributed to the forecast error variance of trade balance and agricultural growth rate contributed least to the forecast error variance of trade balance in Ethiopian trade balance. The absence of the J-curve effect was further confirmed by the IRF position.

6.2. Recommendations

The previous section has presented the summary of major findings of the study. Based on the findings the following recommendations are made for policy purposes;

Ethiopia is still faced with negative trade imbalances especially in the post-liberalization era. Given this, urgent measures need to be considered in order to improve upon it to hasten growth and development in the economy. From the results obtained it can be noted that, depreciation in the Ethiopia birr is not an appropriate step to help improve upon the country's trade balance position. In strong economies like the industrialized countries, market forces can operate on their own to produce self-correcting forces in case of any currency depreciation hence control the trade balance. Unlike these industrialized countries, for developing countries like Ethiopia, self-correcting measures cannot work in terms of controlling the trade balance. Therefore, in relation to this, the most appropriate step to control the country's trade balance is to combine liberalization with proper exchange rate management measures. Other measures of currency stabilization could be adopted to improve the trade balance as a stable exchange rate would enable producers of tradable goods make long-term investment plans.

Appropriate action related to its trade openness by levying tariffs and quotas impose from goods come from abroad in order to increase price and limit imports. Government also provides subsidies to domestic industries and creates competitive advantages to domestic producers in order to compete with foreign producers. In addition to tariff and quotas rationing the available foreign exchange that is allowing foreign exchange only for necessary products (like machinery that used for further production) is also another mechanism used to minimize the country's trade deficit.

Policies aimed at stabilizing money supply in the economy should be adopted. Monetary policy authorities can adopt contractionary monetary policies rather than expansionary ones as this will help control the real money balances of individuals and hence their expenditure patterns to further help improve the country's trade balance position.

Policies to divert household consumption expenditures to domestic goods can also be adopted through the promotion of various made-in Ethiopia goods. In the same vein, import substitution policies for major import goods such as cars, petroleum products and electronic equipments can also be adopted. Create awareness among the people to change their attitude towards domestic products which is highly in favor of foreign product goods. This may help reduce government and household expenditure paths and as such reduce imports relatively. In effect, these will not only aid improve upon the country's trade balance position but will also touch on some key macro-economic variables such as unemployment and in effect aid in growth and development of the country. In addition, policies to improve upon the standards of domestic products should be implemented in order to meet the standard, taste and preference of the Ethiopian consumer, and those abroad.

Again, chunk of government consumption expenditure should mainly be diverted into productive and investment ventures such as the export sector to aid increase volumes of exports rather than spending in non-productive sectors that do not generate any income. Government policies aimed at establishing companies (either solely owned or public private partnerships) purposely for the production of export-oriented and import substitution goods in order to meet export demand and domestic demand.

Considering the fact that the export sector is mainly dominated by agricultural products,

policies to improve upon the growth rate in the agricultural sector can be enforced. Policy makers can invest in newly improved agro-technologies and agro-machines to aid farmers increase production, hence output volumes. Again, various technologies on how to process major agricultural products into finished goods before exports can be considered as this will help to diversify the country's export goods. Policies that enhance the diversification and facilitate the shift towards the export of semi processed and manufactured goods are essential.

One obvious option in this case is to make huge investment in the export sector through a coordinated effort between the private sector and the government. Moreover, policies that diversity the destination of export to new inroads, in addition to the already existing is also essential.

Select and apply appropriate trade policy instruments: To address the problem constraining trade expansion and growth in Ethiopia, it is necessary that the choice of suitable policy instruments reflects the most direct relationship between issues involved in the identified constraint and the instruments available. Trade policy implementation has to prioritize the application of instruments to address specific problems on the basis of anticipated direct impact. Effective trade policy also depends on adopting a common direction for different instruments so that these instruments complement rather than contradict each other. The issue for the future is how the effectiveness of trade reforms is contingent on the existence of other characteristics of the environment in which production and investment decisions are made.

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Repayment Performance Of Farmers: An Empirical Study

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Abstract

This paper studies the impact of bank finance on repayment performance of farmers in delta area and non-delta area in Nellore district of Andhra Pradesh. We observed that in the delta area the sample branches provided finance to the farmers more than to those in the non-delta area. It can be observed that the total repayment performance of the sample beneficiaries was 73 per cent in the delta area and 50 per cent in the non-delta area. The percentage of overdue is less in the delta area than in the non-delta area.

Need for the Study

Several studies have been undertaken to evaluate the role of institutional finance for agriculture at the national level by individual researchers, financial institutions and Government. But area specific studies are comparatively limited in number. Such studies are of great importance on account of the vast, inter-regional variations of bank credit in developing countries like India. Even bank specific studies do not seem to have gone into the different operations of the branches located in Remote areas. The present study of Andhra Pragathi Grameena Bank in Nellore District of Andhra Pradesh is intended to fill this gap. A detailed analysis is made of the impact of Andhra Pragathi Grameena Bank finance on repayment performance.

Objective of the Study

1. To study the repayment performance of the sample beneficiaries in delta area and non-delta area of Nellore District, Andhra Pradesh

Methodology and Sampling

The 90 branches of Andhra Pragathi Grameena Bank, Nellore, are divided into two groups, those serving the farmers in the delta area and those serving in the non-delta area. There are 40 branches in the delta area and 50 branches in the non-delta area. A random sampling of 10 per cent of the total branches namely 9 branches in all was taken, representing 4 branches in delta area and 5 branches in non-delta area. 200 farmers who borrowed loans from the bank during 2016-17 are selected randomly with probability proportional to the size sampling method (PPS sampling method) from the 6 sample branches and pre-tested schedules were canvassed among them and the relevant data was collected.

Repayment performance

One of the most disquieting features of the agricultural credit structure in India is the incidence of ever increasing overdue. The high level of overdue restricts the capacity of lending institutions to recycle funds, besides threatening the prospects of continued flow of external credit for agricultural development. A wide range of causes influence the level and the trends in overdue of the agricultural credit institutions. Although defaults are commonly attributed to adverse conditions, particularly droughts / floods, in some cases, lack of the forward-backward linkages and infrastructural facilities and services which support agriculture, the socio-political environment in which the credit institutions are

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functioning, legal and government support available to the agricultural credit system, besides adverse weather conditions affecting the output of crops, particularly in the rain fed areas. The other causes of overdue which are internal to the credit institutions themselves are inadequate supervision over credit, unsatisfactory management and unsound lending policies and procedures. The distribution of total demand, repayment in different categories of the sample beneficiaries are presented in Table 1.

Table 1: Distribution of Total Demand, Repayment and Overdoes in Different Categories of Farmers

S. No.	Category	Total demand Rs.	Repayment Rs.	Overdose Rs.	Percentage of repayment	Percentage of overdues
1.	Marginal farmers	3,65,000	1,38,700	2,26,300	38	62
2.	Small farmers	8,48,000	4,57,920	3,90,080	54	46
3.	Medium farmers	11,75,000	7,75,500	3,99,500	66	34
4.	Large farmers	15,37,000	11,52,750	3,84,250	75	25
	Total	39,25,000	25,24,870	14,00,130	64	36

Source: Field data.

Table 1 reveals that the total demand from all categories of farmers was Rs. 39,25,000. Out of which the farmers were paid only Rs.25,24,870. The overdues were Rs.14,00,130. The repayment percentage was more by the large farmers (75 percent) followed by the medium farmers (66 percent) small farmers (54 percent) and marginal farmers (38 percent). The percentage of overdues was higher among the marginal farmers (62 percent) followed by the small farmers (46 percent), medium farmers (34 percent) and large farmers (25 percent).

Table 2: ANOVA for Distribution of total Demand, Repayment and Overdues

Source of variation	Degree of freedom (d.f)	Sum of squares (SS)	Mean of squares (MS)	F Values	F. Critical value
Category of farmers	3	9.92E+11	3.31E+11	2.32*	4.066181
Error	8	1.14E+12	1.42E+11		

* 5 per cent level of significant

Source: Table 1.

Table 2 shows that there is a significant difference between different categories of farmers with regard to total demand, recovery, and overdues at 5 per cent level significance in study areas.

It can be observed from Table 3 which follows that the total repayment performance of the sample beneficiaries was 73 per cent in the delta area and 50 per cent in the non-delta area. Obviously the repayment performance was higher in the delta area. The repayment percentage of among the marginal farmers was 44 per cent, small farmers 54 per cent, medium farmers 75 per cent and large farmers 88 per cent in the delta area. In the non-

delta area the repayment percentage of the marginal farmers was 29 per cent, small farmers 54 per cent, medium farmers 49 per cent and large farmers 54 per cent. In the delta area the loan amount repaid by the farmers was much higher than the amount repaid by the farmers of the non-delta area. The reasons are better irrigational facilities, fertile land and better awareness among the farmers regarding repayment of loans.

Table 3: Distribution of Total Demand, Repayment and Overdues in Different Categories of farmers in Delta and Non-delta area

S. No.	Category	Delta area					Non-delta area				
		Total demand Rs.	Repayment Rs.	Overdues Rs.	Percentage of repayment	Percentage of overdues	Total demand Rs.	Repayment Rs.	Overdues Rs.	Percentage of repayment	Percentage of overdues
1.	Marginal farmers	2,19,000	97,090	1,21,910	44	56	1,46,000	41,610	1,04,390	29	71
2.	Small farmers	5,08,800	2,74,750	2,34,050	54	46	3,39,200	1,83,170	1,56,030	54	46
3.	Medium farmers	7,50,000	4,65,300	1,84,700	75	25	4,25,000	2,10,200	2,14,800	49	51
4.	Large farmers	9,45,000	8,34,000	1,14,000	88	12	5,89,000	3,18,750	2,70,250	54	46
	Total	24,25,800	17,71,140	6,54,660	73	27	1,49,9200	7,53,730	7,45,470	50	50

Source: Field data.

The percentage of overdues in the delta area was 56 among the marginal farmers followed by 46 among the small farmers, 25 among the medium farmers and 12 among the large farmers. In the non-delta area the percentage of overdues was 71 per cent among the marginal farmers, 46 among the small farmers, 51 among the medium farmers and 46 among the large farmers.

The percentage of overdues is less in the delta area than in the non-delta area.

Table 4: ANOVA for distribution of total Demand, Repayment and Overdues in Delta and Non-delta area

	Source of variation	Degree of freedom (d.f)	Sum of squares (SS)	Mean of squares (MS)	F Values	F. Critical value
Total Demand	Category of Farmers	3	3.72E+11	1.24E+11	13.79*	9.276628
	Area	1	1.07E+11	1.07E+11	11.94*	10.12796
Repayment	Category of Farmers	3	2.83E+11	9.42E+10	3.92*	9.276628
	Area	1	1.29E+11	1.29E+11	5.38*	10.12796
Overdues	Category of Farmers	3	1.03E+10	3.42E+09	0.09*	9.276628
	Area	1	1.03E+109	1.03E+09	0.09*	10.12796

* 5 per cent level of significance

Source: Table 3.

Table 4 shows that there is a significant difference between different categories of farmers with regard to demand, repayment and overdues at 5 per cent level of significance in the delta and non-delta areas.

Summary

One of the objectives of Andhra Pragathi Grameena Bank is providing financial support to the farmers in rural areas. Viewed from this angle,

The repayment percentage was more by the large farmers (75 percent) and low by marginal farmers (38 percent). The repayment performance was higher in the delta area low in non-delta areas. The percentage of overdues is less in the delta area than in the non-delta area.

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Problems and prospects of Electronic Banking system:- A Case Study On Commercial Bank Of Ethiopia, Nekemte Branch

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Abstract

The study is conducted on the electronic banking practices, opportunities, and challenges of commercial banks. The case of commercial bank of Ethiopia, Nekemte branch the main objectives of the study will be to electronic banking practices, opportunities, and challenges of commercial banks OF Ethiopia Nekemte branch. The respondents of the study are from electronic banking system of Nekekmte town administration office. All necessary data for the accomplishment of the study have been collected from the Banking practice through questionnaires and interview. The result of the data are organized and analyzed by using descriptive through cross tabulation and percentage to analyze the possible solution. The study uses census survey and sampling technique.

Keywords:- Banking : modern technology : customer ; satisfaction.

Introduction

Commercial Bank of Ethiopia (CBE), which will be the state owned bank, will be the leading bank in the country by its large bases of customers, deposits, credits, assets, capital, market share, profit, branch expansions and others. On the other hand private commercial banks have been flourishing and competing by giving closely substitute banking to take some share of the already held and owned portion by CBE. CBE, the leading bank in Ethiopia established in 1942. The first bank in Ethiopia to introduce ATM service for local users, pioneers to introduce western union money transfer service and modern banking to the country Ethiopia (CBE, 2012/13)

Now a day modern technology is being introduced in all the fields and it changes the world with full of innovations. In Banking, also electronic devices play a dominant role in order to satisfy the growing need of the customers. Banking system is the backbone of the economy and information technology in turn will be become the backbone of banking activities. The traditional banking activities are modernized by using the electronic-banking system (E- Banking). These changes are being made duty the influence information technology and the developments in technology of telecommunications and electronic data processing. Information technology, which implies the integration of information system with communication technology, has altered the traditional ways of doing banking and allows banks to wipe out the differences in time as well as a distance (Gemechu, 2012).

The Ethiopian banking industry is one of the service industries crucial to the growth of its emerging economy. Banking is important in the role. It plays in capital mobilization and granting of financial facilities that is crucial to business development and growth. As business always need to find ways of improving products and services deliveries, it will be

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useful to understand how different factors affects the adoption of E-banking system and in which way the technological innovations can benefit the banking industries to provide service to customers (NBE, 2012).

The E- banking concepts become popular when the banking activities and information technology are merged. The banking transactions become easy after the introduction of computers in banking sector. The banks are enabled to automate the accounting process and back

Office functions like maintenance of deposits, calculation of interest and maintenance of general ledgers. The automation of front office function improves the customer service with reduction in processing time. When the internet facilities enter into the banking sector the interbank activities are linked through internet and the concepts of “anywhere banking or internet banking” is also introduced. Internet banking enables a customer to do banking transactions through the banks website in the internet. It is more or less like bringing the bank to the customer’s computer, at the place and time of customer’s choices. (Yohannis; 2010).

To data very little consideration has been given to researching for the challenges and problems associated with the introduction of e- banking locally, and perhaps this why e-banking has not be more widely exploited in this country. Therefore, this study attempts to trace the present status of E- banking in CBE, visualize its opportunities and looks at the challenges to be solved.

Statement of the Problem

In this era of globalization with increased competition around the globe in all sectors, strong banking industry is important in every country and can have a significant effect in supporting economic development through efficient financial services; as the result money, banks in the world are modifying their strategies to reach customers worldwide more easily and cheaply. Therefore, banks are developing the technologies that will help them deliver banking product and services by the most cost effective channels and one of such channel is adopt E-banking (Muche, 2010).

E- Banking is spreading quickly in recent years as it leads to much lower cost and greater competition in financial services. E- Banking helps to attract an individual into the banking system allowing them to improve money management with enhanced financial empowerment. For financial institutions, it draws cash into bank accounts, which can be translated into funds for lending and investment. The adoption and growth of e- banking is found to be very important towards creating a society with its impact on bringing economic transparency, efficiency and growth. From customer’ perspective, the widely recognized drivers for the growth electronic banking includes convenience, reliability, widely availability, affordability and usefulness of services (CBE, 2012).

Despite the growth of e-banking worldwide, commercial banks in Ethiopia, continue to conduct most of their banking transactions using traditional teller based methods. Despite the fact that e-banking will be a lot of benefit for banks and customers in Ethiopia, customers are not enjoying with the technological advancement by low level of infrastructural development, lack of suitable legal and regulatory framework, high rates of illiteracy, frequent power interruption and security issues. Moreover, e banking is a new technology in Ethiopia, which needs a lot of effort and resources to be easily adopted by customers (Sira, 2013).

Hence, in order to banks to improve e-banking adoption by their customers, it is necessary to examine opportunities and challenges that influence customer's intention to adopt e-banking service channels.

Literature Review

Research about e-banking has been conducted from different angles on different topics by a number of researchers. To mention a few of them:-

According to M. Rhaman (2008) in Bangladesh despite huge demand from the business community as well as the retail customers particularly the urban customers, electronic banking (e-banking) is still at a budding state due mainly to a number of constraints such as unavailability of a backbone network connecting the whole country; inadequacy of reliable and secure information infrastructure especially telecommunication infrastructure; sluggish ICT penetration in banking sector; insufficient legal and regulatory support for adopting e-banking and so on.

Since e-banking offers some smart services benefiting both banks and customers compared with traditional banking system, it has become imperative to make necessary room for banks to flourish e-banking. Among others, attractiveness of e-banking includes: it lowers transaction cost; provide 24-hour service; ensure increased security and control over transactions; reduces fraud risk; performs higher volume of transactions with less time; increases number and volume of value payment through banks; allows remote transactions facilities that replace physical presence of customer in bank branch and; increases transaction speed and accuracy. On the other hand, traditional banking is time-consuming and more costly and therefore, e-banking is replacing traditional banking all over the world.

In addition, an exploratory study that will be conducted in Zimbabwe by ChituraTofara (2008) indicated that incompatibility with the existing system, cost of implementation, security concerns, lack of expertise, inadequate legislation and consumer acceptance are the major challenges for the adoption of e-banking in the country's banking industry.

According to M. M Rahman (2008) in Bangladesh e-banking is now a global phenomenon. Apart from the developed countries, the developing countries are experiencing strong growth in e banking. The governments emphasis on setting up ICT park, raising allocation for developing ICT infrastructure, waiving taxes on computer peripherals and other measures including the automation program of banking sector and completion among the scheduled banks in improving customers services have accelerated the prospects of e-banking.

In addition, as investigated by Alhaji Ibrahim H (2009) using exploratory study, the following are among the critical challenges for the adoption of e-banking in Nigeria: lack of technological infrastructure. The implementation of e-payment is been impeded by unavailability of ICT infrastructure. Most rural areas where majority of small and medium scale industries are concentrated have no access to internet facilities ICT equipment costs where available. The cost of ICT is a critical factor relative to per capital income. This makes the cost of entry higher compared to developed countries.

Regulatory and legal issues – in existence of proper legal and regulatory framework Non-readiness of banks and other stake holders (acceptability) even though some have shown impressive willingness, some banks are still not fully ready to for this new payment regime. Resistance to changes in technology among customers and staff due to:

- Lack of awareness on the benefits of new technologies.

- Fear of risk among banks.
- Lack of trained personnel in key organizations and
- Tendency to be content with the existing structures.
- People are resistant to new payment mechanisms.
- Security – where disclosure of private information, counterfeiting and illegal alteration of payment data may be rampant.
- Frequent connectivity failure in telephone lines.
- Frequent power interruption.

The study on key factors that determine adoption of internet banking in Ethiopia by using 300 sample respondents via mixed method revealed that demographic factors including age, income, education level and occupation have a relationship with the adoption of internet banking. Psychological factors including perceived relative advantage, perceived compatibility, perceived complexity, perceived risk, and perceived cost were found to influence the adoption of internet banking. Social influences including opinions of friends, parents and colleagues were not found to be significant factors to influence the adoption of internet banking in the Ethiopian context. (Yohannes, (2010)

Another relevant study on analysis of factors influencing customers' intention to the adoption of e-banking services channels by using research model of technology acceptance model (TAM) revealed that attitude, subjective norm, perceived behavioral control, perceived usefulness and perceived ease of use and perceived risk were significant in affecting users' intention to use e-banking service channels.

However, there is no empirical research conducted on e-banking practices, opportunities and challenges in CBE, Nekemte branch with respect to major dimensions of e-banking such as cultural, infrastructural and legal dimension. Hence, the researcher is interested to address this gap by taking account into these dimensions of e-banking. (Sira, (2013)

Objectives of the Study

- ❖ To identify current practices of e-banking services
- ❖ To investigate the major challenges in the adoption of e-banking service
- ❖ To identify the benefit of adoption of e-banking from the view point of the bank

Research Methodology

This study will be used to both primary and secondary data. The data type of the study will be cross-sectional data since the researcher prefer to study service quality on customer satisfaction at a point in time that is the year 2014/15 .Primary data source is required in order to get from questionnaires' and interview firsthand information with respect to the study under consideration. The secondary data will be collected from CBE's and NBE's annual and periodic reports ,published and unpublished materials, bulletins, magazines, web sites, internet ,journals, books, facts and finding and etc. More over such data source is also required to compliment the primary data sources so that the paper might be better off.

The primary data will be collected through questionnaire. The questionnaire has been administered through date collectors using personal interview type. With regard to the questionnaire, the questions are both open ended and close ended. The secondary data will be collected through published and unpublished materials.

The method of sampling techniques that has been employed this study is simple random sampling. Because it is chosen in order to avoid bias. In random sampling by its nature,

each element in the population has an equal chance of being included in the sample. The sample item comprised of the customers of the bank.

Sample size determination is an important element in any survey research, although it is a difficult one because an under-sized sample can be a waste of resources for not having the capability to produce useful results and on the other hand, an over sized sample costs more resources than necessary (Admasetal, 2007).Furthermore,"in planning of a sample survey, a stage is always reached at which a decision must made about the size of the sample. The decision is important. Too large a sample implies a waste of resources, and too small a sample diminishes the utility of the results."(Cochran, 1977)

The commercial bank of Ethiopia has 919 branches and Nekemte district is one of the fifteen districts of CBE that has 67 branches under its domain. Out of these 67 branches, the study has been conducted in Nekemte branch because of the availabilities of money transfer saving and other services such as ATM, POS mobile banking and SMS services in the branch. The target the population of the study is customers of CEB Nekemte branch who were using at least one of electronic banking services such as ATM, POS, Mobile banking and SMS due to the existence of these electronic banking services in the branch. These include bank staffs and banks customers who were using and non-users of e-banking services. Total number of population of the bank will be300 out of which 260and 40 were banks customers' users' of e banking and bank staff respectively. For the purpose of this study, based on population size, sampling error or the level of precision the confidence level, finance available and time for researcher, sample size has been determined in scientific way. T he following formula is used.

$$n = \frac{N}{1+N(e)^2} \dots\dots\dots(1)$$

Where N the population size is a sample size and e is the level of precision or sampling error. Since in a social science, 1%-10% of errors are acceptable for the purpose of this study, the researcher accepted 10% of error due to of lack time and fund to collect data from large sample.

Since we have N=300, by taking margin of error (e) =10%, by using the following formula;

$$n = \frac{N}{1+N(e)^2} \quad n = 300 / 1 + 300(0.1)^2 = 75. \text{ Therefore, 75 sample respondents}$$

were selected by sample random sample method.

After the required data collected, this study has been analyzed through descriptive statistics such tabulation and percentage computation. This method of data analyzing is selected because of simplicity as compared to that of inferential statistics, which requires hypothesis testing.

Result and Discussion

The objective of this part is to present the results and analysis of our work. The study is conducted in commercial banks of Ethiopia Nekemte Branch with the aim of assessing the practices of e banking, prospects and its challenges. There are seventy-five employees were selected as a sample size determined as by sciatic formula expressed in methodology part.

From the total number of the sampled respondents more than have of them have been workers of CBE move than two years. This help them to judge whether there is e-banking practices or not as these employers have been experience with the bank and they could

deadly state e-banking practices delivery with what they have observed during their worker in the bank.

4.1 Demographic characteristics of sample respondents.

Table 4.1.1. Age of sample respondents

Age group	No. respondents	% percentage
20-25	20	26.67
26-30	30	40
30-35	10	13.33
Above 36	15	20
Total	75	100

Source:- Primary data (2017)

As shown in table (4.1.1) above most of the respondents or the assessed respondents age 20 (26.67%) were b/n the ages of 20-25 group and 30 (40%) is where the age group b/n 26-30 and only 10(13.33%) were b/n the age of 30-35 and only 15(20%) were above age of 36 years, relatively the age viable. This implies that CBE serve its employers whose age is more than 20 years old.

Table 4.2 Distribution of sample respondents by sex

Sex	No. respondents	% percentage
Male	50	66.67
Female	25	33.33
Total	75	100

Source:- Primary data (2017)

From the table (4.2), it could be seen that 50 (66.67%) of the employers were male while 25 (33.33%) female respondents. The implied that interns of gender composition, CBE provides different e banking services both male and female employers.

Table 4.3 Distribution of sample respondents by marital status

Marital status	No. respondents	% percentage
Bachelor	20	26.67
Unmarried	30	40
Windowed	20	26.67
Divorced	5	6.66
Total	75	100

Source:- Primary data (2017)

Regarding with marital status of the sample respondents 20 (26.67%) of them were married (bachelor), 30 (40%) were unmarried (single), 20(26.67), of the beneficiaries were windowed and only 5(6.66%) sample respondents were those who have divorced due to various reasons not explicitly expressed by the respondent them selves. this could be employers of afraid of other person have why they have divorced each other.

Table 4.4. Distribution of sample respondents by educational level

Level of education	No. respondents	Percentage %
Primary	55	73.33
Secondary	10	13.33
Degree	5	6.67
Masters	5	6.67
Total	75	100

Source:- Primary data (2017)

From the information of educational level of the employers, most of the respondents 52(69.33%), 10(13.33%) secondary level and 8(10.67%) of the primary sample level and 5 (6.67%) were master respectively. As it can seen from the table (4.4) above, the number of employees who have achieved master above were very small in number or 6(6.67%). Only 5 (6.67%) of the sample respondents beneficiaries have basic education and do if all things When while, 8(10.67%) are attended in primary education respectively.

Table 4.5 Respondents with CBE Nekemte branch

Years	No. respondents	% percentage
Below 5yers	61	81.33
5-10 yrs	11	14.67
Above 10 yrs	4	5.33
Total	75	100

Source:- Primary data (2017)

Regarding with the status of the employers, the most of respondents 60 (80%) of them were client ship for five years and 10 years. So they have experiences and reflect their will be about e-banking services further move as it can seen from the table above, 11(14.67%) and 4(5.33%) of the employers were below five years and above ten years in terms of their client ship with CBE respectively. This helps to get the employers about e-banking services and whether they are satisfied or not.

Table 4.6 Types Employers to be interviewed a CBE Nekemte branch.

Employees types	No. respondents	% percentage
Bank staffs	65	86.67
Banks customers	10	13.33
Total	75	100

Source:- Primary data (2017)

From the table (4.6) it could be seen that 65(86.67) of the assessed customers of CBE Nekemte branch were employees of the bank while 10(13.33%) of the sampled respondents were banks customers who were using e-banking services.

During that, initiate banks to adopt e- banking service.

- Rapidly changing customer's needs and performances.
- Desire to improve organizational performance with

Desire improve the relationship with customers and reduce tradition on cost cover wide geographical area and organizational reputation and satisfy customers and for the existence of high competition in the banking industry.

From questioner and interview (2017)

As depicted in the above information the driving forces that initiate for the adoption of e-banking service in the bank, the existence of high competition in the banking safety or, rapidly charging customers' needs and preferences, desire to improve organizational performance and improve relationship with customers, reduce transaction cost and build organization reputation and to satisfy customers are the major common dirking forces that initiate banks for the adoption of e-banking as means of services delivers to their customers.

Therefore, from this it is possible to conclude that it is due to the existence of some driving forces in banking services to the customers.

Table 4.7 Challenges of the adoption of e-banking services in CBE

Challenges	Repondents	Percentage
Establishmentof expense	30	40
Lack of skilled man power	20	26.67
Legal frame work	15	20
Socio cultural aspects	10	13.33
Total	75	100

Source:- Primary data (2017)

Information and communication technology (ICT) interest infrastructure is the most to offer and to implement e- banking services. Communication infrastructure is such as (NAN, telephone lie must be adequate for e banking in Ethiopia due to poor telecommunication infrastructure ICT is lot problems or challenges. Ethiopia telecommunication or portion is unable to provide reliable and fast telecommunication services. Failures telephone and other network lines are happening frequently. This will create problems to offer e-banking services. Especially internet is the major problem b/c of low and wide and low speed. Another major problem is frequent electric reducer disruption. This will create al of problems in the e-banking activities w/c are the banks to depend on generators results in high operational cost. These problems are considered as obstacles for the expansion of e-banking services in the country.

❖ **Establishment Expense**

Initially banks have to invest huge amount of money in order to provide e- banking services. They have to buy and install the required systems and facilities, which lead increased establishment expense. For well-established banks like commercial banks Ethiopia, the establishment cost may not be a problem. However, for small and new banks, it is very difficult to invest such a huge amount.

❖ **Lack of skilled man power**

In order to maintain e-banking services without any fault, Banks need skilled manpower. However, in Ethiopia the banks are suffering due to in adequate skilled manpower. They have to hire manpower from foreign counties to overcome this problem. Otherwise, they have to provide proper training to the existing manpower. Both all result increased operating expenses.

❖ **Legal frame work**

Legal framework is playing role in facilitating e-banking systems and in its growth instead of strict regulation, the country should make some amendments in order to coincide with the e-banking practices. Ethiopia has not yet set a comprehensive legal framework for e-commerce in general and e banking in particular. The reason for non-existence of comprehensive legal framework in Ethiopia may be the lesser e-banking activities. Another reason may be the many standards to incorporate technical and imitational improvements. The Ethiopian civil code addresses some of the most important legal issues pertaining to electronic transactions. But mostly in developed counties they have developed compressive legal frame work for e-commerce w/c includes e-banking. The national bank of Ethiopia does not clearly mention its in regulating the e-banking system in its governing legislation. It has some short comes such as e-signature, lack of significant penalties for frauds and other a buses and lack adequate non existence of legal frame work may be the banks, w/c provide so we of the e-banking services, height have not faced any major problem regarding the regulatory aspects. Legal is crucial and anticay as for conducting e banking

our country having the adequate and sufficient infrastructure capabilities and having a favorable cultural acceptance and smooth e-banking business. In fact, a safe, the adequate legal and regulatory coverage and facilitation are essential as well.

❖ **Socio-cultural aspects**

Commercial banks of Ethiopia have some problems related to social and cultural attitude. There is assistance to changes among customers and some staff members. There is mainly because of lack of awareness on new technologies and its benefits. The fear risk is also another reason for their resistance. In case of staff members, the lack of training and sticking with existing structure are the problems.

Table 4.8 Existing opportunities for the adoption of e-banking services.

Opportunities	Respondents	Percentage
Commitment of govt to facilitate the expansion of ICT infrastructure	40	53.33
Improvement in the banking habit of the society	10	13.33
Sustainable economic growth in the country	10	13.33
Increment of tourist inflow to Ethiopia	10	13.33
The existence of high demand for e-banking user	5	6.67
Total	75	100

Source:- Primary data (2017)

Table 4.9 Benefits realized by banks from the adoption of e-banking service

Benefit	No Respondents	Percentage
Attracting high rule customers	5	6.67
Enhanced image, larger customer coverage	10	13.33
Improvement of organizational efficiency	15	20
Better monitoring of their customer based	30	40
Load reduction	6	20
Total	75	100

Source:- Primary data (2017)

As reported in the above table, commercial bank of Ethiopia believes that providing banking proudest to the customer by using electronic channels hare the benefit of building good image. Load reduction that enables bank employees to focus on strategic issue instead of focusing on traditional activities and improvement of organizational performance through cost reduction by avoiding paper work and by reducing the number of employees required. Hence, it is possible to conduce that deriving banking proudest through electronic channels made the bank benefited.

Table 4.10 Current practices and exist ante of e-banking services in Ethiopia.

e-banking channels	Respondents	Percentage
ATM	40	53.33
SMA	20	26.67
POS	8	10.67
Mobile banking	2	2.67
Internet banking services	5	6.66
Total	75	100

Source:- Primary data (2017)

Commercial bank of Ethiopia is providing ATM, SMS, POS mobile banking and services for the customer. As a result, customers of the bank can get the services listed in the above table. However, the respondents were asked which type of e-banking services you use. Accordingly, 53.33% of the respondents use ATM followed by SMS, 26.67% and POS, 10.67% and 2.67% mobile banking and 6.66% is in ternate banking in each respectively. This is due to recent introduction of e-banking channels like POS, mobile banking and internet ternate banking.

4.2 Advantages and limitations of E-banking in CBE

Table4.11 Advantages and Limitations of E-banking in CBE

Advantage and limitations	No Respondents	Percentage
Very convenient	15	20
Higher internet	20	20
Speed	30	40
Poorly delivered	15	13.33
Frequent changes adjustments	5	6.67
Total	75	100

Source:-Primary data (2017)

4.2.1 Advantages of e-banking

- Very convenient, comfortable and easy way to do whatever monetary transaction you wish to do with your bank
- Provides 5% service as the e-bank never closes and has no out of time.
- Smart and interactive without solutions and troubleshooting functionalities.
- Higher interest rate enabled through the cost savings achieved by digital form capabilities.
- Speed and laziness of conducting the digital transaction compared to paper based dealing with in customers.
- Used to save time and cost.

Computed from primary data (2017)

4.3.2 Disadvantages of E- Banking

- ❖ Poorly delivered e-banking services can be slow and time consuming.
- ❖ Some identify them frication requirement can be annoying and over whirligig for elements.
- ❖ Might require a lot of paper work and producers for registration and self up such documentation.
- ❖ Can be difficult for clients to get familiarized with the bank's website and e-banking channels each bank has its own unique website and methods.

- ❖ Frequent changes and adjustments to the bank's website and delivery channels that require re-familiar action and in some cases re-registration and document.
- ❖ Destruct by some client's counties with primitive legal system and reliable technological infrastructure might face security and legal challenges.
- ❖ Some clients still prefer human interaction and personalized attention.

Table 4.12 what kind's services should you do with on line?

Kinds of service	Respondents	Percentage
Fund transfer between accounts	10	13.33
For checking account balance	15	20
With what of cash from Account	20	26.67
Purchase of goods and services	30	40
Total	75	100

Source:- Primary data (2017)

Table: 4.13 why do you prefer e-banking rather than manual banking?

Reason for performing e-banking	Respondents	Percentage
Reduced cost	9	12
Convenience	20	26.67
Speed	35	46.67
Fraud management	11	14.66
Total	75	100

Source:- Primary data (2017)

Table 4.14 safety and scanty of using on line banking

Level of set station	Respondents	Percentage
Satisfactory	15	20
Poor	30	40
Good	20	26.67
Excellent	10	13.33
Total	75	100

Source:- Primary data (2017)

From the above table presents the safety and security of using on line banking by customers of commercial bank of Ethiopia at Nekemte branch. From the table, it could be seen that safety and security of using on line banking will be satisfactory a may sample respondents 20% of the customer said the safety and security of using on line banking will be good 40% of them is poor and 13.335 percent is were excellent.

Conclusion

From as summarized, the main objective of the study will be to assess the e-banking, practices, opportunities and challenges of CBE of Nekemte branch to recommend so the opportunities and challenges would take responsible. Today e- banking became a fact and even a survival issues for banks with their clients trusting and demanding it as a convenient, safe and trust worthy way of conducting banking transactions.

Moreover, bankers use it as a complete edge and a method to efficiently and effectively expand their business beyond the geographical barriers CBE has been using e-banking services for the past years now, CBE started in order to respond to customers demand and to cut their operational activities and related costs and ultimately to expand their market share and peruse a different strategy.

The main practice e-banking channels include: ATM, SMS, POS, mobile banking and internet banking (13) are used for balance enquire, cash withdrawal and instatement purchase of goods and services.

ATM, SMS, POS, mobile banking internet banking services and other electronic payment systems are at infant stage.

In a view of the extent of e-banking adoption, majorities of the banks have not adopted this technology and are using manual services to reach and serve their clients. In general, banks in Ethiopia are trailing behind in acquiring the required quality of banking services to effectively compete in the global market.

Adoption of e-banking services have the benefit of attracting high value customers, handed image, larger customer coverage, improvement of organizational efficiency and load reduction and etc. from the view point of the bank. And also enhancing customer satisfaction reduce the number of customers come to the banking hall, increase the productivity of the banks, increase liability and accessibility of banking service, creating good relationship b/n clients and banks also used as abettor information. Finally, communication of the government to facilitated the expansion of ICT infrastructure, improvement in the banking habit of the society, sustainable economic growth in the country, increment of tourist inflow to Ethiopia and willingness among banks to cooperate in building infrastructure are among the major opportunities for the adoption of e-banking in the country.

Therefore, from this it is possible to conclude that there are good opportunities for the adoption of e-banking services in Ethiopia.

The study of found that in Ethiopia the e-banking aspects are recent phenomenon then the bank is aiming to in the duce these aspects to their customers.

The major challenges of e banking in the commercial bank of Ethiopia are

- Lack of infrastructure facilities.
- Unbearable establishment cost.
- Lack of skilled manpower.
- Unavailability of comprehensive legal framework.
- Socio cultural e banking in the case of commercial banks of Ethiopia.

Recommendation

Based on the finding of the study, the following recommendations are forwarded. It gives the valuable suggestions to increase the e-banking services with the consideration of prospects of e-banking in Ethiopia. These given below:

- ❖ In Ethiopia ICT, infrastructure facilities are not well adopted. Due to this, banks are in opposition to extent the e-banking services.
- ❖ Another constrain in ICT is high cost structure. For e-banking, services the banks need 24 hours internet service, but in Ethiopia, the cost of dial up internet is expensive. Because of these banks are not positions expend e-banking services. In order to overcome this problem, the cost of ICT has to be reduced and ICT services should be available for all people in cost effective manner.
- ❖ In order to establish e-banking, banks must go for automation of banking services within the bank. That is bank have to create links b/n all branches of the bank by using financial network system. Here the banks are facing problem relating to the reliable electric power providers should take efforts to provide uninterrupted power supply throughout the country.

- ❖ Most of the banks, especially small banks' in Ethiopia are not in opposition to establish the e-banking services due to high establishment of cost. For existence if the bank wants to install ATM, it has to incur huge amount of establishment of cost. In order to overcome this problem the banks can go for low cost products such as low cost ATM, which will reduce the establishment cost up to some extent otherwise, banks can offer these services jointly. For instance, the small banks can share the ATM of well-established banks in order to provide services to their customers.
- ❖ The Ethiopian banks are lacking in skilled manpower that is necessary to extent e-banking services. Sometimes the banks may face resistant from the staff members to establish these services. First all, the banks have to create reliable environment for e banking. It plays a crucial role in developing the e banking. The Ethiopian civil code is not enough to make still Ethiopia hags behind in establishing separate legal framework for e-commerce that includes e banking such as data protection laws, internet laws etc. The government has to give emphasis on establishing comprehensive legal framework in order to facilitate e banking.
- ❖ In order to overcome the problem relating to socio cultural aspects, the banks have to create public awareness about the benefits of new technologies and its impact. Them the schools higher institutions and media should give due attention to achieve the above. The banks should bold enough to face these types of problems.
- ❖ Familiarization and awareness Company. As it is the case with any other new service /technology/ introduction in market, the considerable portion of customer would prefer to avoid the changes and wait until its well tested and used by others. The regulatory bodies, CBE and other concerned parties should coordinate launching a public campaign through the local media channels with a focus on assuring customers of the legitimacy and reliability of e banking.
- ❖ In the e-banking industry, the role of government is not enough or excellent because networking in the county is not well improved then government should be creating awareness for the society.

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Underpricing Of Book-Built Equity Initial Public Offerings in India

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Abstract

The study examines the level of underpricing of book built equity initial public offerings in India offered through Bombay Stock Exchange from 1st April, 1999 to 31st March, 2018. Price behaviour (level of underpricing) has been evaluated with the help of average market adjusted abnormal return (Avg. MAAR). The study is based on a sample of 406 companies which launched their IPOs through book building pricing mechanism during the study period. It is concluded that during the study period book built IPOs in the Indian market remained underpriced. The level of underpricing has been observed 17.32 % during the study period. The results of the study are in line with previous studies conducted by Kumar (2003), Singh (2003), and Kumar Vinod (2013) etc.

Introduction

A business organization requires long term finance for its establishment and expansion. The long term finance can be raised from primary market through the issue of equity shares, preference shares, bonds etc. Of all these instruments equity shares are most prominent. Which is evident from the fact that out of total Rs. 1,10,269 crore raised during 2017-18, Rs. 1,05,097 crore were raised through equity issues whereas Rs. 5,173 crore were raised through debt issues (SEBI Annual Report 2017-18). When company offers equity shares to public in open market for the first time, this is known as Initial Public Offering. According to SEBI annual report share of IPOs out of the four modes of resource mobilisation -- IPOs, FPOs, bonds and rights issues has gone up significantly from just 2.2 per cent in 2013-14 to 75.9 per cent in 2017-18. Similar trend is also observed for SME Platform. During the year 2017-18, an amount of Rs. 2,250 crore through 156 issues was raised through SME platform which is 1.6 times of the funds raised in 2016-17. The company may offer its shares to the public either at fixed price or it may offer a price range. If the shares are offered at fixed price, then the issue is known as fixed price issue. If a share are offered at a price range and investors are asked to make bids to determine the price of shares, then such issue is known as book-built issue. As suggested by various studies IPOs are generally underpriced. The study is an attempt to measure the level of underpricing of book built equity IPOs offered through Bombay Stock Exchange during the period from 1st April, 1999 to 31st March, 2018.

Review of Literature

Krishanmurti and Kumar (2002) conducted a study on 386 IPOs to measure the initial listing performance of Indian IPOs. Results showed that for overall sample the market adjusted return using Sensex as proxy was 72.34 per cent. **Singh & Singh, Mittal (2003)** studied 500 IPOs floated between years 1992-1996. It was found that an average

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underpricing was 83.22 per cent. The market adjusted underpricing was 75.16 per cent. The study reported that par issues were more underpriced than premium issues. **Jankiramanan, S (2007)** conducted a study on 116 IPOs issued during the period 2000-01. The study found under-pricing in Indian Market.. **Shelly, Singh (2008)** reported that the market adjusted initial return (MAIR), reputation of lead manager and age of the company have significant impact on level of subscription.

The study also proved that underpricing is in existence in Indian IPO market and oversubscription has the positive significant impact on underpricing. Age and Issue Size have significant negative impact. **Sahoo, Seshadev & Rajib, Prabina (2010)** analyzed 92 Indian IPOs issued during the period 2002- 2006. They found that on average IPOs were underpriced by 46.55 per cent on the listing day. **Kumar Vinod & Dhanda Neelam (2013)** examined 488 IPOs offered through BSE during 1993-2008, for both long term and short term price performance; the study proves existence of underpricing in Indian IPO market. Average market adjusted abnormal return & wealth relative were used as price performance indicators. The average market adjusted abnormal return was 82.67 per cent on the listing of IPOs. **Kumar Vinod & Dhanda Neelam (2013)** in another study of Comparative Pricing Behavior between At Par & at Premium Initial Public Offers in India analyzed 170 at par and 318 premium initial public offers during the period 1993-94 to 2007-08. They also witnessed existence of underpricing in Indian capital markets. **Kumar Vinod & Dhanda Neelam (2013)** in their study "Determinants of Underpricing: Indian Evidence" studied a total of 488 companies taking 166 Companies from 1993-94 to 1996-97 and 322 companies from 1997-98 to 2007-08 and reported that IPOs in Indian capital market are underpriced and analyzed the different factors affecting level of underpricing. **Kumar Vinod (2016)** analyzed 488 IPOs of 23 sectors. This study also concludes that all the 23 sectors have shown underpricing on listing day of IPO. Telecom sector scored highest Average MAAR i.e. 525%. **Kumar Vinod (2017)** studied 18 IPOs offered in the calendar year 2015. It is proved that exit on listing day is more profitable than one year after listing. **Narang Sahil and Kumar Vinod (2017)** in their study "Underpricing of Initial Public Offerings: An Indian Evidence" considered a sample of 49 IPOs offered during 2014-2016 and proved that there is underpricing in Indian IPO Market. The Avg. MAAR was 14.63 %. **Dhuria Akshay and Kumar Vinod (2018)** in their study "Pricing Of Initial Public Offerings In India: A Study Based On BSE" studied a sample of 46 book built IPOs offered during the financial year 2017-18 and concluded that book built IPOs were underpriced. The level of under-pricing was 11.16%.

Objectives

Objectives of the research are:

1. To determine the raw return and market adjusted abnormal return of initial public offerings offered through BSE ;
2. To analyse the market price performance on listing day of book built initial public offerings ;
3. To measure the level of underpricing of book built IPOs from 1st April, 1999 to 31st March, 2018.

Sample Plan of the Study

This study is based on a sample of 406 companies which offered equity shares through BSE during the study period. Extensive sampling has been used while selecting the

sample. Only those companies are excluded from the sample for which the data is not available.

Data Collection

To accomplish the objectives of the research, secondary data is used. The data relating to issue price, listing date, closing price of share on the listing day, closing SENSEX on the listing day is collected from the website of the Bombay Stock Exchange. Other sources of data are <https://economictimes.indiatimes.com>, www.sebi.gov.in, www.chittorgarh.com, SEBI annual report 2017-18 and handbook of statistics of SEBI.

Methodology

Average market adjusted abnormal return (avg. MAAR) on listing day has been calculated to determine the level of underpricing. Average MAAR is calculated as below:

First of all, **Return on a Stock** on listing day has been calculated as:

$$R_i = [(P_i/P_o) - 1] * 100$$

Where R_i is return on stock, P_i is closing price of stock on listing day and P_o is the issue price.

Return on Market Index is calculated as:

$$R_m = [(P_{m1}/P_{m0}) - 1] * 100$$

R_m is return on market index. P_{m1} is the closing value of the benchmark index on the first trading day of the stock and P_{m0} is the closing value on the benchmark index on the offer's closing day. In this study BSE SENSEX is used as benchmark index.

Market Adjusted Abnormal Return

MAAR = $R_i - R_m$

$$\text{Average MAAR} = \frac{1}{n} \sum MAAR_i$$

Hypothesis of the Study

Average market adjusted abnormal return is not significant or underpricing does not exist in Indian IPOs market.

Analysis and Statistics

Table 1: Summarized Position of Pricing Behavior of IPOs on Listing Day during the study period

Pricing Behavior	No. of IPOs	Average MAAR (%)
Under priced	261	34.79
Overpriced	145	-14.14
Total	406	17.32

Source: Data compiled by researcher.

Out of the total 406 IPOs during the study period, 261 IPOs were underpriced and 145 were overpriced.

Table 2: Descriptive Statistics of IPO

	N	Minimum	Maximum	Mean	Std. Deviation
Raw Return (%)	406	-81.70	241.75	17.38	39.46
Index Return (%)	406	-22.90	20.71	.067	5.38
MAAR (%)	406	-87.38	241.58	17.32	38.58
Issue Price (Rs.)	406	6	1766	242.80	252.67

Source: Data compiled by researcher

The average issue price of 406 companies is ₹ 242.80. The offer price of Dixon Technologies (India) Limited was highest (₹1766). Everonn Systems India Ltd. has given the highest raw return (241.75 %) and market adjusted abnormal return (241.58 %). The average raw return and average MAAR of the 406 IPOs was 17.38% and 17.32% respectively.

Table 3: Year wise Price Performance of IPOs on Listing Day

The following table shows the average raw return, average market adjusted abnormal return for each financial year during the study period.

Sr no.	Year	No. Of IPOs	Average Raw Return (%)	Average MAAR (%)	Price Performance
1.	1999-2000	3	-22.29	-5.70	Overpriced
2.	2000-2001	11	13.68	14.32	Underpriced
3.	2001-2002	1	-1.89	-10.89	Overpriced
4.	2002-2003	1	25.89	31.85	Underpriced
5.	2003-2004	5	64.56	64.07	Underpriced
6.	2004-2005	9	42.75	42.71	Underpriced
7.	2005-2006	40	34.71	30.51	Underpriced
8.	2006-2007	53	13.14	14.54	Underpriced
9.	2007-2008	60	29.08	27.97	Underpriced
10.	2008-2009	15	18.16	25.59	Underpriced
11.	2009-2010	33	10.98	8.91	Underpriced
12.	2010-2011	41	7.39	7.17	Underpriced
13.	2011-2012	26	4.13	4.32	Underpriced
14.	2012-2013	7	1.64	2.38	Underpriced
15.	2013-2014	1	15.37	17.83	Underpriced
16.	2014-2015	7	21.49	22.92	Underpriced
17.	2015-2016	23	6.25	8.38	Underpriced
18.	2016-2017	24	21.83	21.25	Underpriced
19.	2017-2018	46	11.34	11.16	Underpriced

Source: Data Compiled by researcher.

Table 3 reveals that level of underpricing (Average MAAR) was highest in the financial year 2003-04 i.e. 64.07 %.

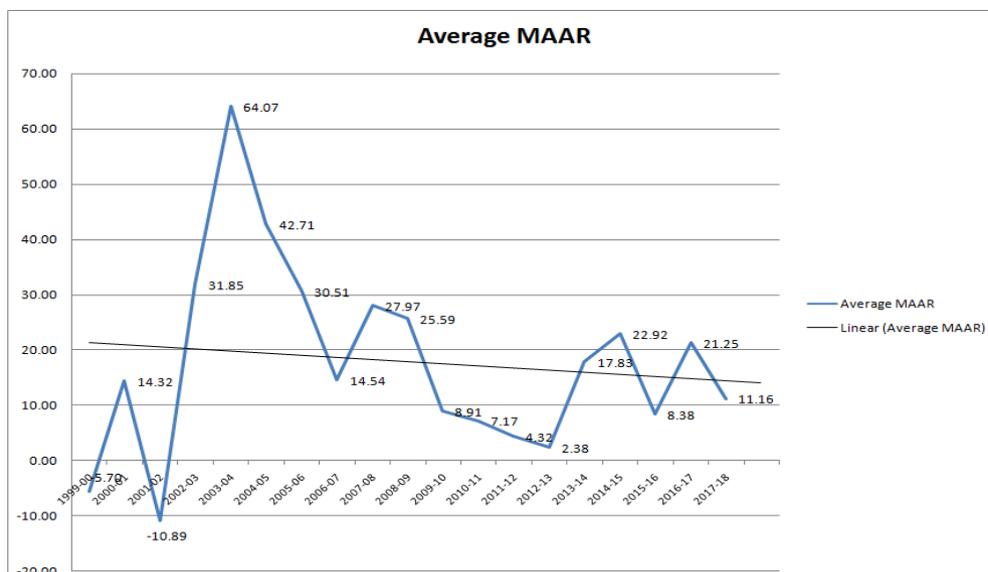


Figure 1: Year wise Price Performance of IPOs on Listing Day

Source: Data Compiled by researcher.

Linear trend line in the figure 1 shows that level of underpricing is declining over time.

One Sample T test Results

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
MAAR	406	17.32	38.58	1.91

One-Sample Test

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
MAAR*	9.04	405	.000	17.32	13.55	21.08

*Significantly different than zero at 5% level of significance.

As the Average MAAR of 406 IPOs during the study period is significantly different than zero at 5% level of significance, the null hypothesis i.e. average market adjusted abnormal return is not significant, is rejected. It proves that Indian Primary Market has been remained underpriced during the study period.

Conclusion

The study concludes that book built IPOs in India have been underpriced as indicated by Average Market Adjusted Abnormal Return i.e. 17.32%. The results of the study are in line with the previous studies. It is also analyzed that level of underpricing of book built initial public offerings offered through Bombay Stock Exchange shows declining trend during the study period.

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Factors affecting wheat production:-A case study on Horo woreda zone of Oromia region

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Abstract

Agriculture is the backbone for every developing country like Ethiopia. In spite of this, it has not been able to satisfy the food requirements of their people. Hence, it is very important to understand the determinants of agricultural productivity. In line with this, the main objective of this study is to assess the factors affecting wheat production:-A case study on HORO woreda zone of Oromia region. The specific objectives of this study are to assess the factors affecting wheat production and to come up with some possible recommendation for policy makers. To assess this problem the cross-sectional data has been collected. The paper has employed both descriptive and econometrics statistics to analyse the stated objectives. The study has found that land size, number of oxen, fertilizers and improved seed has positive effects in wheat production whereas family size has negative impact on the wheat production. Since seed and fertilizers has positive impact on the yield capacity of wheat output farmers should be encouraged in order to use them and government should provide credits to farmers in order to purchase those inputs.

Keywords: Wheat; Productivity; Fertilizer

I. Introduction

For poorest countries agriculture provides the leading sources of employment and contributes the larger fraction of their national income. Especially Sub-Saharan African countries economy highly depends on agriculture. Since Ethiopia is one of the Sub-Saharan African countries its economy is highly dependent on agriculture (WB, 2011). Agriculture is the backbone of the Ethiopian economy. It contributes more than 50 percent of GDP, 85 percent of labor force employment, 95 percent of total export and supplies 70 percent of the country's raw material requirements for industries (Ayele, 2006).

The current government of Ethiopia adopted the Agricultural Development Lead to Industrialization (ADLI) strategy as the overall development strategies of the country since 1995. One of the main facts of this strategy in the agricultural sector has been the generation, adoption and diffusion of new farm technologies in the form of new and improved inputs and practices. In the mobilization of small farmers and the dissemination of better farming practices, the agricultural development practices has been operationalized through Participatory Demonstration and Extension Training System (PDETS) (EDRI, 2004).

Global cereal production in 2008 reached a record high of an estimated 2245 million tones enough to cover annual projected needs and to allow a modest replenishment of world stocks. However, the increase was accomplished by the developed countries. In response to more attractive prices they increased their cereal output by 11 percent. In developing countries by contrast only recorded an increase of 1.1 percent. In fact if we exclude China, India and Brazil from the group production in the rest of the developing world actually fell

by .8 percent. The poorest and most food insecure farmers who most needed to profit from higher cereal prices could not respond to the opportunity and expand production because of access to inputs or marketing opportunities. As result of this issue increasing cereal crop production is the main strategy of many developing countries (FAO, 2009).

The growth in agricultural productivity that has occurred in the last century is strongly associated with the invention and commercialization of new technologies and inputs for crop cultivation (Pardey et al., 2012). Currently, an increase in productivity, especially in the presence of natural resource constraints, is likely to be achieved by targeting input efficiency by means of innovations in fertilizers, plant protection products (i.e. pesticides, fungicides and herbicides) and mechanization (e.g. precision seeding machines, tractors with global positioning system –GPS- guidance, etc.) (Petersen et al., 2010). Yield increases may also result from improved varieties with traits for biotic and abiotic resistance, and traits that promote nutrient use efficiency and yield stability (Peltonen-Sainio et al., 2009).

The availability of new or improved inputs is directly related to the level of research and development (R&D) investment, both from the public sector and from the private sector. The average rate of growth of public agricultural R&D spending has been decreasing in developed countries, from 9 percent in the period 1960–1970 to 1 percent in 2000–2009 (Pardey et al., 2012). It is likely that the result will be a slow-down in gains in agricultural productivity and crop yields as a result of a failure to develop innovative tools against emerging problems (e.g. innovative pesticides against new pests or diseases). The agro-chemical inputs most used in agriculture are inorganic fertilizers and plant protection products.

The quantities used by farms are driven by the need not only to maximize agronomic outputs, but also to optimize the cost–benefit relationship. Farmers adjust the rate of input use according to, among other things, the expected harvest price at the end of the season (Vigani et al., 2013). A similar type of adjustment is also made to the type of crop variety used, with higher-quality; lower-yielding varieties that obtain higher market prices being preferred over higher-yielding varieties of a lower quality (Evenson and Gollin, 2003). The rate of adoption of agro-chemical inputs is also driven by a growing tendency to adopt environmentally friendly and sustainable agricultural practices.

One important way to increase wheat productivity is that, reducing factors of agriculture production (physical factor, economic factor and in addition factor) through diffusion of improved technology ,using chemical fertilizer and land management practices and training farmer (CSA 2002). Therefore, this particular study tries to identify the factors that affect wheat productivity in this study paper.

II. Statement of Problem

Agricultural output of developing countries is characterized by low productivity which is more difficult to attain food self-sufficiency. Increasing population size and low level of agricultural production have a critical problem in sub-Saharan African countries including Ethiopia. Particularly, million people in Ethiopia are chronically food insecure. Even in good harvest year partly rely on food aid (Ayele, 2006).

The food insecurity is situation by widening the gap between demand and supply of food, which is resulted from increasing population size, variation of climate access instability of product market. In other way the sector is highly dependent on the rain fall with minimum percent of arable irrigation (FAO, 2001).wheat farm operation uses labor intensive for

preparation, weeding and harvesting. Hence increasing the production and efficiency in wheat production could be taken as an important to attain food security and increase the income of the farmers.

In Ethiopia, wheat ranks fourth in total crop area and production. It is grown in the highlands at altitudes ranging from 1500 to 3000 masl. Wheat is a staple food crop for most households in rural and urban areas in Ethiopia. However, wheat yield is low and unstable due to several technical and socioeconomic constraints. (Getahun and Legese, 2001).

III. Review of Literature

The ability to increase wheat production has been one of the major challenges faced by agriculture over the last 20 years not only because wheat is currently a key staple cereal for millions of people worldwide, but also because wheat demand is expected to dramatically increase in the near future as a result of the foreseen increase in the global population and dietary changes (CENEB and CIMMYT, 2012).

Gezhegn and Tadesse (2004) on the adoption of improved technologies in Ethiopia reported that age of the farmer and distance of the farmer from the market center had a negative impact on the adoption of improved technologies. On the other hand household size and farm size of the farmers contact with extension agents had strong and positive effects on the adoption of improved technologies in Ethiopia.

Agricultural production in Ethiopia is characterized by severe fluctuation in near and highly correlated to the overall performance of economy. Agricultural share in GDP is about 53% during the Derg and 51.2% under EPRDE. The highest growth rate in agricultural was achieved in 1986/87 when it grew by 18.8% while the lowest was achieved in the drought year of 1984/85 where it declined by 21 % (EEA, 2000).

In Ethiopia most agricultural sectors are dominated by small holder farmers. These small holders on average account for 95% of total area under crop and for more than 90% of total agricultural output (Stephenson, 2005).

In Ethiopia most agricultural sectors are dominated by small holder farmers. These small holders on average account for 95 percent of total area under crop and for more than 90% of total agricultural output (Stephenson, 2005). Smallholder farmers are those marginal and sub marginal farm households that own or land cultivated less than 2 ha. Of land, they cultivate about 78% of country's farmers.

Wheat output in Ethiopia is quite low by world standards and: average 1.7 ton/ha as compared global average of about 5ton/ha. Wheat research in Ethiopia started half a century ago passed through distinct stage of research and development (kebede et al., 2004). From 1952-1980, introduction and evaluation of wheat materials from different parts of the world for local farmers. Although wheat is an introduction within year remained below 20 million quintal and wheat production area exceeded one million hectare (Kebede et al., 2002).

In 2000, wheat area was 20.86 percent of total area under cereal in the country while grain production of wheat accounted for 32.6 percent of total cereal production. (CSA, 2001) The agricultural sector is the backbone of the Ethiopian economy because of it constitutes almost half of GDP but also because of more than 80 percent of the population still depends on it for their livelihood. As a result, the government has given more attention to the development of agriculture. So that they would increasingly benefit from the small

plot of land and surplus labor could increasingly move to industrial sector. However the attempts to increase productivity have not yield the expected outcome (EEA, 2007/8).

IV. Objectives of the Study

- ❖ To identify of the major determinants of wheat production.
- ❖ To identify the existing institutional challenges in the study area.

V. Methodology of the Study

This includes the data collection methods, sampling techniques, and procedures of data collection and analysis. Both primary and secondary data were used for this study. The primary data were collected from rural small holders' farmers producing Wheat in the study area. For this purpose questionnaire were used to collect this data. Besides, the study was also supported by secondary data that collected from different sources like official reports, books, CSA and other statistical compilation and internets.

The sample for this study was drawn from the population of smallholders' farmers residing in the rural area of Horo woreda. Among these farmers the target population for the sample only includes those farmers producing Wheat in the production period of 2008 EC.

Multi-stage sampling techniques were used to select the sample from the total target population. In the first stage, three Peasant Associations (PAs) namely KombolchaCanco, GitiloKebeleand ChabirKebele were selected purposively among the total of 20 PAs based on the extent of wheat production. In second stage, once the total sample size of 50 is fixed using sample size formula developed Cochran's (1963) it is distributed to each PA proportionately to their relative share in the total size. In the third stage, the representative sample of the study selected using a simple random sampling approach.

$$n = \frac{Z^2 P(1-P)}{e^2}$$

Where: n sample size and p=population proportion

e level of precision (3%, 5%, 7% and 10%)

z level of confidence for 90% is (1.64)

The three selected kebeles have 2200 household heads. From these house heads 1995 house hold heads were Produced Wheat in 2007/2008 E.C. From this P is calculated as:

$$p = \frac{\text{producer}}{\text{Target popualtion}} = \frac{1995}{2200} = 0.9$$

$$n = \frac{(1.64)^2 \times 0.9(1-0.9)}{0.07^2} = 50$$

The total sample size was then distributed among the PAs proportionately to their relative size in the total using the formula:

$$n_i = \frac{N_i}{N} * 100$$

Where Ni= the total number of observation in the (i) Kebele.

N= total numbers of house hold heads in three Kebeles

ni= the same size of (i) Kebele

Accordingly, the total sample size of the study is distributed among PAs as it is shown in form of

Table 1.as follows

No.	Pas	Total HHHs	Sample size
1	KombolchaCancokebele	1000	22
2	GitiloKebele	700	15
3	ChabirKebele	500	13
	Total	2200	50

Primary data for this study were collected using enumerator administered questionnaire in which the enumerator fills the answer asked by him. This method has the advantage of considering illiterate household heads in the sample and ensures accuracy and reliability of data collection through personally explaining the significance of inquiry and the questions in the questionnaire to the informant household head.

The collected data are going to be analyzed by using both descriptive and inferential approaches. We planned to use tables, percentage, statistical values and graph for descriptive analysis.

Besides, we planned to conduct inferential analysis using model for identifying the relationship between the production of wheat and its factors. We will use the multiple linear regression models because wheat production is determined by more than one variable.

$$Q_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \mu i$$

Where

Q_{it} = quantity of Wheat produced measured in quintal

X_{1t} = number of oxen used in production of Wheat

X_{2t} = the land used for Wheat production measured in hectares.

X_{3t} = family size of the farmer.

X_{4t} = the amount of improved seed measured in Kilogram.

X_{5t} = the amount of fertilizers used in Wheat production measured in kilograms.

μi = error term

In the model the quantity of wheat produced (as dependent variable) determined by other independent variables. Statistical software package like STATA 13 was employed in the analysis of the research.

V. Data Analysis

As shown in the methodology part, Fifty (50) respondents are selected as a representative of the target population. Accordingly the data is collected from all the 50 respondents using structured questionnaire.

VI. 1. Descriptive analysis

In this part, the results of descriptive analysis are reported which are based on cross-sectional data collected from fifty (50) small holder framers selected from Horo woreda. The survey data were used to describe the socio-economic characteristics and demographic characteristics of the respondents.

VI. 1. 1. Households Heads and Members Characteristics

VI. 1. 1. 1. Sex and Age Composition of Household Heads

From **Table 2** among the total respondents 40(80%) are male respondents while the reaming 10(20%) are female. This implies that woreda's males were more participants than females in wheat production activity.

Table 2. Sex composition of respondents

Sex	No. of respondents	Percentage (%)
Female	10	20%
Male	40	80%
Total	50	100%

Source: Survey Result, 2018

Regarding the age structure, there was age variation among the respondents. The youngest house hold has age of 20, while the oldest has age of 70 with difference of 50. Since the maximum and minimum measures are crude, it would be better to use group frequency distribution. By grouping their ages in to 5(five) categories with 10(ten) gaps between the group.

Table 3 reveals that the total sample is 50 households. From this 94% are in the ages human being are active and capable of performing any activity. Those their ages below and above 61 were accounted 6%. From this we conclude that 6% of the total population is depending on the production of 94% of the population. This has resulted in the substance type of farming in which most of produced output is left for consumption purpose.

Table 3. Age composition of respondents

Age composition Age interval	No respondent	Percentage (%)
20-30	17	34%
31-40	12	24%
41-50	11	22%
51-60	7	14%
61-70	3	6%
	50	100%

Source: Survey Result, 2018

VI. 1. 1. 2. Education Levels and Marital Status of House Hold Heads

As **Table 4** revealed among the total respondents 6(12%) are illiterate, 28(56%) are first cycle, 16(32%) are second cycle and these no above second cycle. The data implies above 56% of the farm population are first cycle. Therefore it may results a positive impact on wheat production.

Table 4. Educational Levels of Household Heads

Educational status	No respondents	Percentage (%)
Illiterate	6	12 %
First cycle 1-8	28	56 %
Second cycle 9-12	16	32 %
Total	50	100 %

Source: Survey Result, 2018

From **Table 5** among the total respondents 41(82%) are married 9(18%) unmarried. The data implies from the total respondents the married house hold heads has a large share by participation in wheat production.

Table 5 .Marital Status Household Heads

Marital status	No of respondents	Percentage (%)
Unmarried	9	18 %
Married	41	82 %
	50	100%

Source: Survey Result, 2018

VI. 1. 1. 3. Family Size of Households Heads

As shown from **Table 6** below majority of the house hold heads 30 (60%) out of the interviewed house hold have family size from 6-10. From this we observe that most of the households in Horo woreda use family labor in the production of wheat. In other ways these data implies that the house hold in the studied area are first cycle, whose have experience type of farming in which most of produced output is for consumption purpose.

Table 6.Family size of households

Family size	Frequency	Parentages (%)
0-5	19	48 %
6-10	30	60 %
> 10	1	2 %
Total	50	100 %

Source: Survey Result, 2018

As shown in **Table 7** a significant amount of 88% of form household heads is literate and 12% of them are illiterate able to read and write. These indicate that most of the farmers of the area were literate the consequence is direct and proportional on the production of wheat.

Table 7. Family size distribution by the status of illiteracy

Status of illiteracy	Frequency	Percentage
Illiterate	225	88
Not illiterate	80	12
Total	305	100

Source: Survey Result, 2018

VI. 1. 2. House hold Wheat Production Related Information

VI. 1. 2. 1. Total Output of Wheat Produced

From **Table 8** the researcher examined that the maximum level of output was 42(84%) quintals of wheat was produced in 2017. Conversely, the minimum level of output of wheat is 8(16%) quintal this might be because of these farmers did not use enough fertilizer and not use selected seed.

Table 8. Quintals of Wheat Produced by Number of Household Head

Range of output	Frequency	Percentage
15-25	11	22
25-35	10	20
35-45	9	18
45-55	12	24
55-65	5	10
65-75	1	2
75-85	2	4
Total	50	100

Source: Survey Result, 2018.

VI. 1. 2. 2. Land Used for Wheat Production

Land size and wheat production have relationship. From this **Table 9** more production exist in hectares are above 1.8 lands in hectares.

Table 9. Land of Household Head (in Hectors)

Land (in hectors)	Frequency	Percentage
1	17	34%
1.5	16	32%
1.8	12	24%
2	1	2%
3	3	6%
4	1	2%
Total	50	100

Source: Survey Result, 2018.

VI. 1. 2. 3. Numbers of Oxen Used for Wheat Production

Number of oxen and wheat production has its own relationship which is seen by **Table10**. This relationship tells us the increase in the wheat production.

Table 10 Number of Oxen Used to produce wheat for Household Head

No oxen	Frequency	Percentages
1-2	48	96
3-4	2	4
Total	50	100

Source: Survey Result, 2018.

VI. 1. 2. 4. Labour Used for Wheat Production

Labour was used for the production of wheat for various purposes like ploughing, weeding, and harvesting. It is observed from the **Table 11** that in the production season among the households surveyed around 60 % (30 in number) were using 3 to 5 labours per day for this purpose. The maximum record of the labour use is about 8 labours per day.

Table 11 Number of Labour per day to Produces

Labors per day	Frequency	Percentages
0-2	12	24
3-5	30	60
6-8	8	16
Total	50	100

Source: Survey Result, 2018.

VI. 1. 2. 5. Fertilizer Used by DAP and UREA for Wheat Production

DAP and wheat production have own relationship. It is observed from the **Table 12** that the maximum use of DAP house hold used in percents27 (54). So they produce more. The maximum use of UREA house hold used in percents24 (48). So they produce more. Thus, when there is increase in the use of both DAPS and UREA there is increase in production of wheat.

Table 12 Fertilizer Used for Wheat Production Both DAP and UREA

No of DAP	Frequency	Percentage (%)	No of UREA	frequency	Percentage (%)
50-100	19	38	50-100	20	40
100-200	27	54	100-200	24	48
200-300	4	8	200-300	6	12
Total	50	100 %	Total	50	100%

Source: Survey Result, 2018.

VI. 1. 2. 6. Improved Seed Used for Wheat Production

It is observed from the **Table 13** that only 24(48%) of the respondent are using improved seed to produce wheat, where the remaining 26(52%) are not using improved seed and they use local variety of wheat. The reason for those farmers not using improved seed is due to its high prices and lack of awareness of improved seeds. When there is increase in amount of improved seed, there is increase in the production of wheat. Thus, more use of selected seed in the production process increase the wheat production by more amounts.

Table 13. Improved Seed for Production of Wheat

Improved	Frequency	Percentages
0-100	7	14
100-200	35	70
200-300	8	16
Total	50	100

Source: Survey Result, 2018.

Thus, the main factors affecting the wheat production are farm size, fertilizers, selected seed, number labor (family labor) and number of oxen used.

VI. 2. Econometric Analysis

This section tries to analyses the factor that determines wheat production in Horo woreda. The OLS regression analysis is employed for estimation purpose. This section presents the findings from the econometric results on the determinants of wheat production. The section covers regression model used in this study and the results of the regression analysis.

In table 4.16, shows coefficient, standard errors, t-values and p-values for explanatory variables and R-square, adjuster R-square, standard error of regression, F-statistics, prob (F-statistics) for the regression, and number of observation included in the study are presented.

From table 4.16 the R-square and adjusted R-square of the model are 0.8754 and 0.8473 respectively. The total variation in the dependent variable that can be explained by the independent variable is 84.72%. In this model, 84.72% of the performance of explanatory variable in this model explained the variation of dependent variable and the remaining 15.28% is explained by other variables not included in the model. Thus these variables collectively have good explanatory power in explaining the production of wheat.

These variables are also significant in jointly influencing the dependent variable which is wheat production. This confirmed by the F-statistics value which is significant even at less than one percent level of significance.

Before directly going for interpretation some test for multicolinearity and heteroscedasticity are conducted. The result obtained is free of multicolinearity because the mean VIF is about 3.5 which is less than the 10 threshold.

Table 14. Variance Inflation Factor of the Model

Variable	VIF	1/VIF
Noox	6.93	0.144283
Fuse	6.52	0.153449
Lsize	4.47	0.223584
Inpse	2.61	0.383827
Age	1.50	0.668871
Lperday	1.33	0.750379
Educ	1.15	0.871745
Mean VIF	3.50	

The model is also free of heteroscedasticity. The test is conducted using Breusch-Pagan / Cook-Weisberg test. The decision rule is, if the p-value of the Breushpogan test is greater than any of the chosen significance levels i.e. 10%, 5% and 1% which indicates no problem of heteroscedasticity. Thus, the result indicates that prob chi 2 of 57.36% greater than any significance levels and study conclude these shows the same variance among error terms.

Table 15. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: variances are constant	
chi2 (1)	0.32
Prob> chi2	0.5736

Computed by stata 13, Survey Result, 2018

Therefore, the final estimated model result is presented as in the **Table 16** as follows.

The coefficient of land size is found to be significant by less than 1% level of significance and showed the expected positive sign. This means that a 1% increased land size in hectares will lead to 88.7% increase in wheat production.

The coefficient of family size was found to be significant by less than 5% level of significance and showed negative sign. This means that a 1% increase in family size leads to 12.2% decrease in wheat output. The result might be due to the probability of the existence of unproductive and inactive labor is wide as the number of family size increases.

When family size increase, they needs many food, shelter and other basic needs therefore output produced only used for consumption purpose not used for purchasing inputs and to adopt agricultural technology which is result by low productivity. Therefore wheat production and family size has indirect relationships.

The coefficient of fertilizers was found to be significant by less than 1% level of significance and showed the expected positive sign. This means that a 1% increase in fertilizer in unit will leads to 20% increase in wheat output.

Table 16. Results of regression analysis

Prob>F = 0.00

F(9, 41) =31.21

Qprod of wheat	Coef.	Std. Err	t	P> t	[95% Conf.Interval]	
Sex	-1.2971561	2.383448	-0.54	0.589	-6.114254	3.519972
Age	0.3739552	0.0954244	0.39	0.697	-0.1554644	0.22302553
Mstatus	4.5767883	3.0497115	1.50	0.141	-1.586916	10.74049
Edu	-0.34566249	0.2985219	-1.16	0.254	-0.9489603	0.2577104
Land size	8.874926	2.960677	3.00	0.005	2.891176	14.85868
No oxen	-0.0189304	3.636883	-0.01	0.996	-7.369345	7.331484
Labours	-1,222645	0.5693841	-2.15	0.038	-2.73143	-0.07877
Impseed	0.0200561	0.0254869	0.79	0.436	-0.314548	0.0715671
Fertused	0.0747321	0.0200311	3.73	0.001	0.0342477	0.1152165
Cons	1.23927	5.4577636	0.23	0.822	-9.791024	12.26956

R-squared = 0.8754

Adj R-squared = 0.8473

VII. Conclusions and Recommendations

Though agriculture is the backbone for Ethiopian economy; it has not been able to satisfy the food requirements of their people. Hence, it is very important to understand the Factors affecting of agricultural production and productivity with respect to wheat production. In line with this, the main objective of this study is to assess the factors affecting of wheat production in Horo woreda of Oromia region.

In order to examine this problem the cross-sectional data is collected. Based on descriptive and econometric analysis results the study has reached on the following conclusions.

- The Woreda is mainly dominated by literates' male farmers, whose usage of improved technologies' high.

Based on the major finding of these study the recommendation are as follows. In Horo woreda, there is low production of wheat crop; so that in order to improve the production and to ensure the socio-

economic well being of residents of Horo woreda the following measure should be taken.

- The farmer should have to use any kind of improvement such as enough improved seeds, modern farming techniques and etc. The agricultural sectors should be highly encourages and lead the farmers by giving more technical (professional) follow up, to get highly qualified yields and to improve the production technique. Since the production of wheat crop depends on land size, fertilizer, temperature and rainfall the metrological agencyand agricultural office should work together with each other on this issue
- The educational status of household head is at its stages.
- The productivity of wheat from the farm land size is relatively large as we compare with other area which wheat is produced extensively.

The study found that land size, fertilizers has positive effects in wheat production whereas family size has negative impact on the wheat production.

- The study area Horo woreda. is one of the most prominent woreda which is engaged by subsistence agriculture of wheat production in Oromia regional states

Based on the results drawn, the study gives the following policy implications.

- The educational background of the respondent need to be further enhanced through facility in addition the farmers should use family planning which helps to minimize family size
- Since fertilizer has positive impact on the yield capacity of wheat output farmers should be encouraged to use fertilizer and government should provide credits to farmers in order to purchase inputs.
- When family size increase, they needs many food, shelter and other basic needs therefore output produced only used for consumption purpose not used for purchasing inputs and to adopt agricultural technology which is result by low productivity. Therefore wheat production and family size has indirect relationships.
- Increased land size in hectares will lead to increase in production and productivity of wheat production especially in Horo Woreda.
- Government should provide credit services and other methods how the formers get capital to produce wheat.
- The farmers should work together in order to share experiences with each other.

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Experimental Study of Stabilization of Soil Using Fly Ash and Lime

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Abstract

In most of the developed areas, borrow earth is not easily available which has to be hauled from very far distance. Quite often, large areas are covered with highly plastic and expansive soil, which is not suitable for stabilization purpose. Extensive site and lab research have been carried out by researchers in lab and have shown promising results for application of such expansive soil after stabilization with additives such as sand, silt, lime, fly ash, etc. As fly ash is available in large amount, so it can be used for stabilization of expansive soils for various uses. The present paper describes a study carried out to check the improvements in the properties of expansive soil with fly ash in varying percentages. The knowledge of soil Stabilization in geotechnical engineering has been well documented. Journal articles and text books on stabilization technology are available to the students, practicing and consulting engineers in the field of geotechnical engineering. This state of the art review brings up to date trends in stabilization practice with the main focus in stabilization methods and materials. The first part of this review discusses the effect of various binders on stabilized soils. The second part describes stabilization methods and equipment. The review describes in brief modernized stabilization methods and equipment to practicing engineers. For detailed information about the subject matter, readers should refer to the cited authors available in the reference list.

1.0 Introduction

1.1 General

Soil stabilization is the process of changing soil properties to improve strength and durability. The improvement of stability or bearing power of the soil is done by the use of controlled compaction, proportioning and/or the addition of suitable admixture or stabilizers. The soil was not suitable in the present form for construction of ash dyke due to the following reasons:

1. Poor workability for compaction. The construction schedule was critical and it was necessary to carry out the work during monsoon when optimum moisture content cannot be achieved.
2. High compressibility and leading to dyke top settlement.
3. Inadequate shear strength for required slope stability.

1.2 Objective

The main objective of this project is to geotechnical improve areas of weak soil with the help of lime and fly ash into a construction material is an established and extremely cost-effective construction method.

1.3 Need For Soil Stabilization

- Limited Financial Resources to Provide a complete network Road System to build in conventional method

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- Effective utilization of locally available soils and other suitable stabilizing agents.
- Encouraging the use of Industrial Wastages in building low cost construction of roads.

1.4 Purpose Of Soil Stabilization

There are three purposes of soil stabilization. They are

- i. STRENGTH IMPROVEMENT:** This increases the strength of the existing soil to enhance its load-bearing capacity.
- ii. DUST CONTROL:** This is done to eliminate or alleviate dust, generated by the operation of equipment and aircraft during dry weather or in arid climates.
- iii. SOIL WATERPROOFING:** This is done to preserve the natural or constructed strength of a soil by preventing the entry of surface water.

2.0 Benefits

- In situ treatment is typically much more cost-effective than traditional 'dig and dump' methods.
- Soil stabilization can shorten construction periods by minimizing site preparation requirements, tipping and import activities.
- Avoid the wastage of materials, for example sub base materials, can be completely avoided by treating in situ soils, using a quick and simple treatment process, to achieve equivalent or higher levels of structural stiffness.
- Soil stabilization causes lower cost, lower congestion and less neighbour conflict.
- As all available soils can be used, tipping is virtually eliminated as well as associated tipping charges.

3.0 Basic Principles of Soil Stabilization

- Evaluating the properties of given soil.
- Deciding the lacking property of soil and choose effective and economical method of soil stabilization.
- Designing the Stabilized soil mix for intended stability and durability values.

4.0 Methods of Soil Stabilization

i) MECHANICAL STABILIZATION

- This method is suitable for low volume roads i.e. Village roads in low rainfall areas.
- This method involves the correctly proportioning of aggregates and soil, adequately compacted to get mechanically stable layer
- The Basic Principles of Mechanical Stabilization are Correct Proportioning and Effective Compaction

ii) SOIL CEMENT STABILIZATION

- Soil Cement is an intimate mix of soil, cement and water, compacted to form a strong base course
- Cement treated or cement modified soil refers to the compacted mix when cement is used in small proportions to impart some strength
- Soil Cement can be used as a sub-base or base course for all types of Pavements

iii) SOIL LIME STABILIZATION

- Soil- Lime has been widely used as a modifier or a binder.
- Soil-Lime is used as modifier in high plasticity soils
- Soil Lime also imparts some binding action even in granular soils

iv) SOIL BITUMEN STABILIZATION

- The Basic Principles of this stabilization are Water Proofing and Binding
- By Water Proofing inherent strength and other properties could be retained
- Most Commonly used materials are Cutback and Emulsion
- Bitumen Stabilized layer may be used as sub-base or base course for all the roads

5.0 Organic Soil

Red soils develop in a warm, temperate, wet climate under deciduous forests and have thin organic and mineral layers overlying a yellowish-brown leached layer resting on red layer made of iron oxide (ferric oxide). Red soils cover the eastern part of the peninsular region comprising Chhotanagpur, Orissa, eastern Madhya Pradesh, the Nilgiris and Tamil Nadu.



6.1 Red Soil in India

Red Soil in India comprises of more drainage properties than other types of soils as it is formed of clay, created by wearing and tearing of limestone and formed by the breakdown of igneous rocks and metamorphic rocks. When limestone erodes, the clay enclosed within the rocks remains intact with other forms of non-soluble materials. In oxidizing conditions, rust or iron oxide develops in the clay, when the soil is present above the water table giving the soil a characteristic red colour. Red soil in India lacks nitrogenous material, phosphoric acid, organic matter and is rich in iron. Some of the major crops grown in the red soil in India include groundnut, millets, ragi, rice, potato, sugarcane, wheat, tobacco etc.

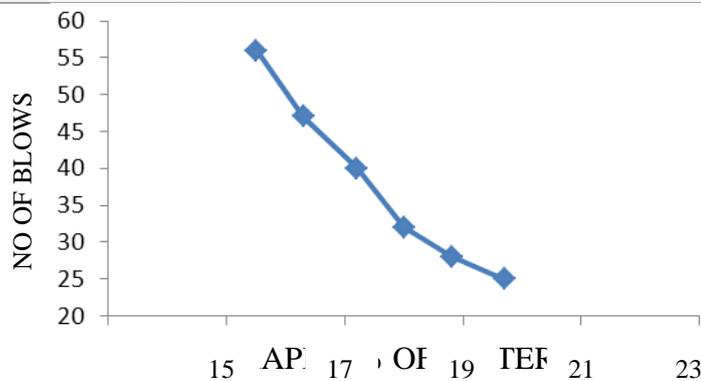
6.2 Features of Red Soil

Red soils are formed as a result of the draining down of old crystalline rock, less clayey and sandier in nature. This is having a rich content of iron plus small humus content. The content of essential nutrients like nitrogen, phosphorus and lime is very less in red soils. Slightly acidic, it is incapable of retain moisture. It is due to the presence of iron oxide deposits, that red soils get the unique red tint and are comparatively infertile because of lime deficiency and soluble salt content.

Red Soil in India is alternatively known as Yellow Soil. The presence of a good concentration of iron oxide is responsible for giving this soil its yellowish or reddish shade. Heavily leached, it consists of a considerable concentration of iron oxides similar to Laterite soil in India. Comparatively, Red Soils are less clayey and sandier. Moreover, Red soils are formed in those areas which receive significantly low rainfall and therefore are less leached in comparison to the Laterite soil in India.

6.3 Liquid Limit Test

Water content	No of blows	% of water
21	56	17.5
22	47	18.3
23	40	19.2
24	32	20
25	28	20.8
26	25	21.7



7.0 Stabilization of Soil Using Flyash

7.1 Flyash

Fly ash, also known as flue-ash, is one of the residues generated in combustion, and comprises the fine particles that rise with the flue gases. Fly ash is generally captured by electrostatic precipitators or other particle filtration equipment before the flue gases reach the chimneys of coal-fired power plants, and together with bottom ash removed from the bottom of the furnace is in this case jointly known as coal ash. Depending upon the source and makeup of the coal being burned, the components of fly ash vary considerably, but all fly ash includes substantial amounts of silicon dioxide (SiO₂) (both amorphous and crystalline) and calcium oxide (CaO), both being endemic ingredients in many coal-bearing rock strata.

7.1.1 Chemical Composition

Component	Bituminous	Subbituminous	Lignite
SiO ₂ (%)	20-60	40-60	15-45
Al ₂ O ₃ (%)	5-35	20-30	20-25
Fe ₂ O ₃ (%)	10-40	4-10	4-15
CaO (%)	1-12	5-30	15-40
LOI (%)	0-15	0-3	0-5

7.1.2 Utilization of Fly Ash

- Concrete production, as a substitute material for Portland cement and sand
- Embankments and other structural fills (usually for road construction)
- Grout and Flowable fill production
- Waste stabilization and solidification
- Cement clinkers production - (as a substitute material for clay)
- Mine reclamation
- Stabilization of soft soils
- Road subbase construction
- As Aggregate substitute material (e.g. for brick production)
- Mineral filler in asphaltic concrete
- Agricultural uses: soil amendment, fertilizer, cattle feeders, soil stabilization in stock feed yards, and agricultural stakes
- Loose application on rivers to melt ice
- Loose application on roads and parking lots for ice control
- Other applications include cosmetics, toothpaste, kitchen counter tops, floor and ceiling tiles, bowling balls, flotation devices, stucco, utensils, tool handles, picture frames, auto bodies and boat hulls, cellular concrete, geopolymer, roofing tiles and so on...

7.1.3 Classification

Class Fly ash

The burning of harder, older anthracite and bituminous coal typically produces Class F fly ash. This fly ash is pozzolanic in nature, and contains less than 20% lime (CaO). Possessing pozzolanic properties, the glassy silica and alumina of Class F fly ash requires a cementing agent, such as Portland cement, quicklime, or hydrated lime, with the presence of water in order to react and produce cementitious compounds. Alternatively, the addition of a chemical activator such as sodium silicate (water glass) to a Class F ash can lead to the formation of a geopolymer.

Class C fly ash

Fly ash produced from the burning of younger lignite or subbituminous coal, in addition to having pozzolanic properties, also has some self-cementing properties. In the presence of water, Class C fly ash will harden and gain strength over time. Class C fly ash generally contains more than 20% lime (CaO). Unlike Class F, self-cementing Class C fly ash does not require an activator. Alkali and sulfate (SO₄) contents are generally higher in Class C fly ashes.

7.1.4 Soil Stabilization

Soil stabilization is the permanent physical and chemical alteration of soils to enhance their physical properties. Stabilization can increase the shear strength of a soil and/or control the shrink-swell properties of a soil, thus improving the load-bearing capacity of a sub-grade to support pavements and foundations. Stabilization can be used to treat a wide range of sub-grade materials from expansive clays to granular materials. Stabilization can be achieved with a variety of chemical additives including lime, fly ash, and Portland cement, as well as by-products such as lime-kiln dust (LKD) and cement-kiln dust (CKD). Proper design and testing is an important component of any stabilization project. This allows for the establishment of design criteria as well as the determination of the proper chemical additive and admixture rate to be used to achieve the desired engineering properties.

7.2 Specific Gravity Test for Flyash

Sl. No.	Observations and Calculations	
Observation		
1	Pycnometer No.	1
2	Mass of empty Pycnometer (M ₁)	602
3	Mass of Pycnometer and dry soil (M ₂)	802
4	Mass of Pycnometer, soil and water (M ₃)	1659
5	Mass of Pycnometer and water (M ₄)	1563
Calculations		
6	M ₂ – M ₁	200
7	M ₃ – M ₄	96
8	G = (M ₂ – M ₁)/(M ₂ – M ₁) - (M ₃ – M ₄)	1.923

8.0 Soil Stabilization Using Lime

8.1 Hydrated Lime

Quicklime can be processed into hydrated lime by crushing the quicklime, adding water to the crushed lime (water accounts for approximately 1% of raw hydrate), and then classifying the hydrated lime to ensure it meets customer specifications before it is transported.

9.0 Unconfined Compressive Test

i) SOIL + 4 % OF LIME +20% OF FLYASH FROM SOIL WEIGHT

Length =91mm

Diameter=38mm

Compression dial gauge reading		Proving ring dial reading			A'=A/1-ε mm ²	stress=ρ /A' *10 ³ KN/mm ²
Divisions	ΔL mm	divisions	ρ N	ε=ΔL/L		
20	0.2	5	36.35	2.20*10 ⁻³	1136.61	0.032
40	0.4	11	79.95	4.40*10 ⁻³	1139.12	0.070
60	0.6	19	138.13	6.59*10 ⁻³	1141.63	0.120
80	0.8	25	181.75	8.79*10 ⁻³	1144.17	0.159
100	1.0	36	261.72	10.99*10 ⁻³	1146.71	0.228
120	1.2	43	312.61	13.19*10 ⁻³	1149.27	0.272
140	1.4	47	341.69	15.38*10 ⁻³	1151.83	0.297
160	1.6	51	370.77	17.58*10 ⁻³	1154.40	0.321
180	1.8	59	428.93	19.78*10 ⁻³	1157.02	0.370

ii) SOIL + 6 % OF LIME +20% OF FLYASH FROM SOIL WEIGHT

Length =90mm

Diameter=38mm

Compression dial gauge reading		Proving ring dial reading			A'=A/1-ε mm ²	Stress=ρ /A' *10 ³ KN/m ²
Divisions	ΔL mm	divisions	ρ N	ε=ΔL/L		
20	0.2	10	72.7	2.22*10 ⁻³	1136.63	0.064
40	0.4	26	189.02	4.44*10 ⁻³	1139.17	0.166
60	0.6	39	283.53	6.66*10 ⁻³	1141.71	0.248
80	0.8	48	348.96	8.88*10 ⁻³	1144.27	0.305
100	1.0	55	399.85	11.11*10 ⁻³	1146.85	0.349
120	1.2	61	443.47	13.33*10 ⁻³	1149.43	0.386
140	1.4	62	450.74	15.56*10 ⁻³	1152.04	0.391
160	1.6	66	479.82	17.77*10 ⁻³	1154.63	0.416
180	1.8	68	494.36	20.00*10 ⁻³	1157.26	0.427

iii) SOIL + 8 % OF LIME +20% OF FLYASH FROM SOIL WEIGHT

Length =90mm

Diameter=38mm

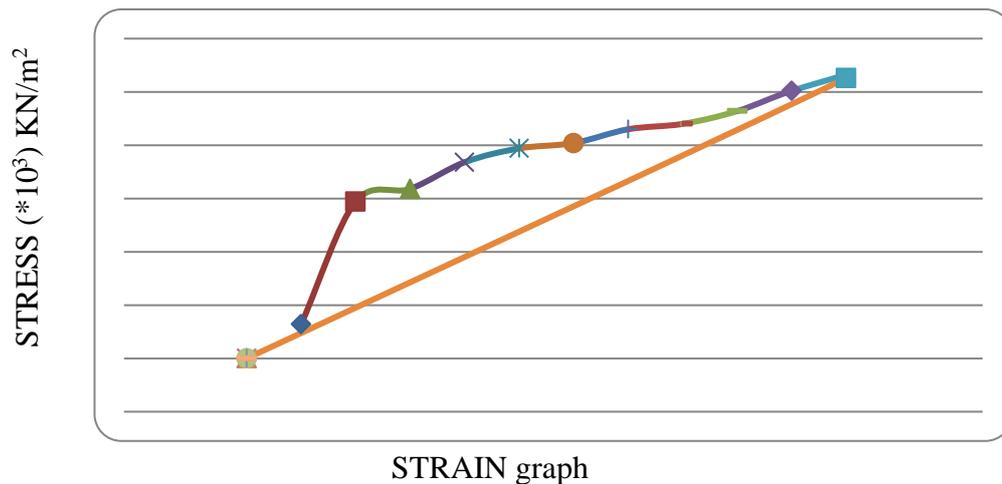
Compression dial gauge reading		Proving ring dial reading			A'=A/1-ε mm ²	Stress=ρ /A' *10 ³ KN/m ²
Divisions	ΔL mm	divisions	ρ N	ε=ΔL/L		
20	0.2	15	109.05	2.22*10 ⁻³	1136.63	0.096
40	0.4	30	218.10	4.44*10 ⁻³	1139.17	0.191
60	0.6	41	298.07	6.66*10 ⁻³	1141.71	0.261
80	0.8	48	348.96	8.88*10 ⁻³	1144.27	0.305
100	1.0	53	385.31	11.11*10 ⁻³	1146.85	0.336
120	1.2	61	443.47	13.33*10 ⁻³	1149.43	0.386

140	1.4	70	508.90	15.56×10^{-3}	1152.04	0.442
160	1.6	77	559.79	17.77×10^{-3}	1154.63	0.485
180	1.8	84	610.68	20.00×10^{-3}	1157.26	0.508
200	2.0	85	617.95	22.22×10^{-3}	1159.88	0.533
220	2.2	86	625.22	24.44×10^{-3}	1162.52	0.558

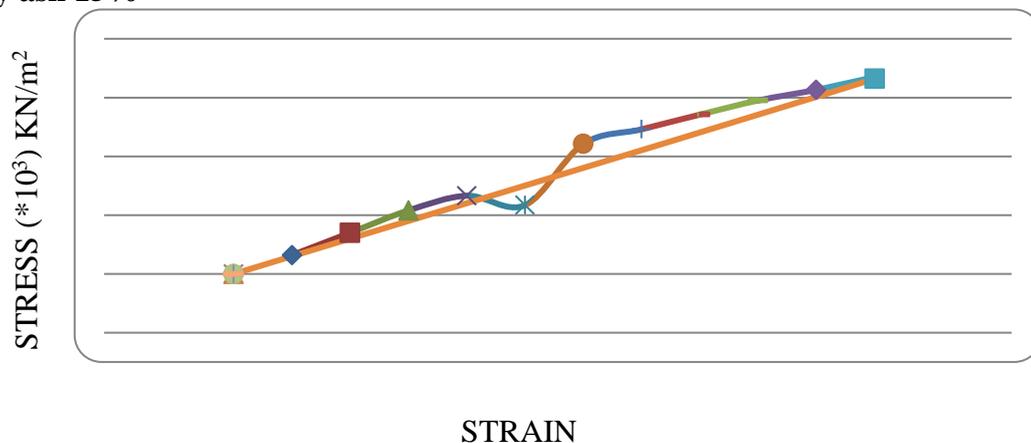
10. Results And Discussion

- From the results obtained the strength of fly ash,lime,mixture of lime and fly ash provides more strength than the target mean strength of normal soil.
- The compressive strength gest improved a lot comparing to the normal soil results
- The compressive strength of the soil is explained in the graph which is given below.

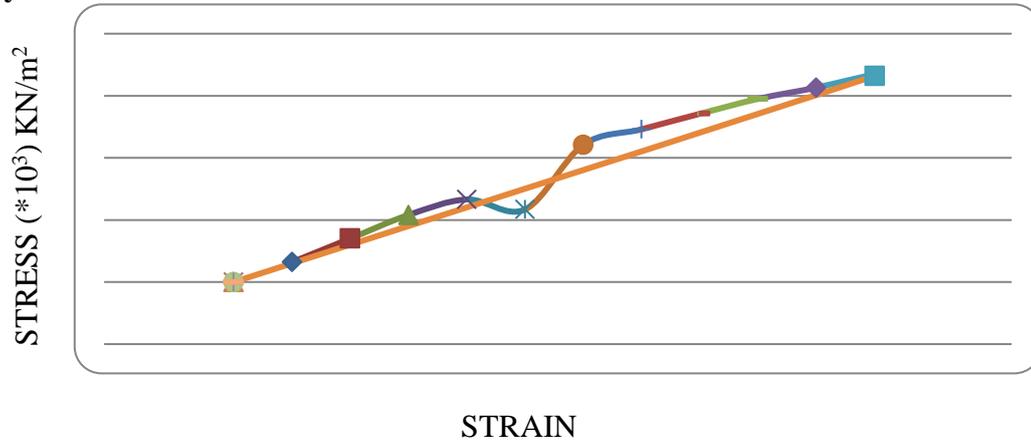
GRAPH: Normal soil



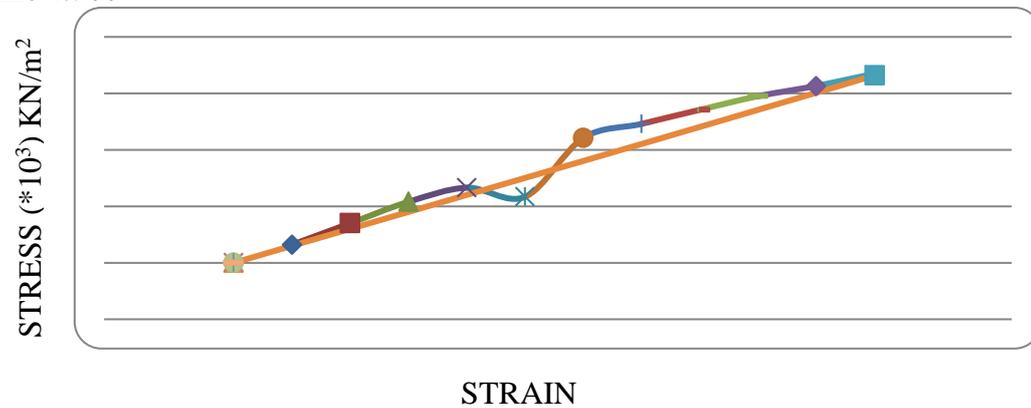
ii) Fly ash 15%



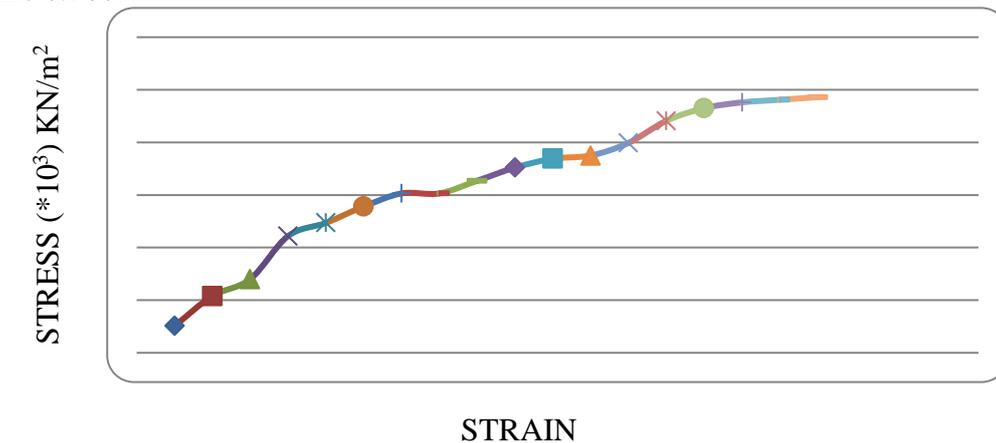
iii) Fly ash 20%



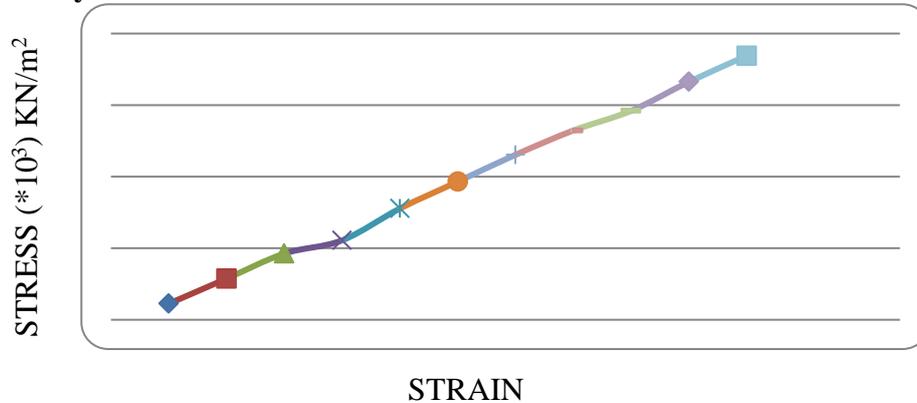
ii) Lime 4.5%



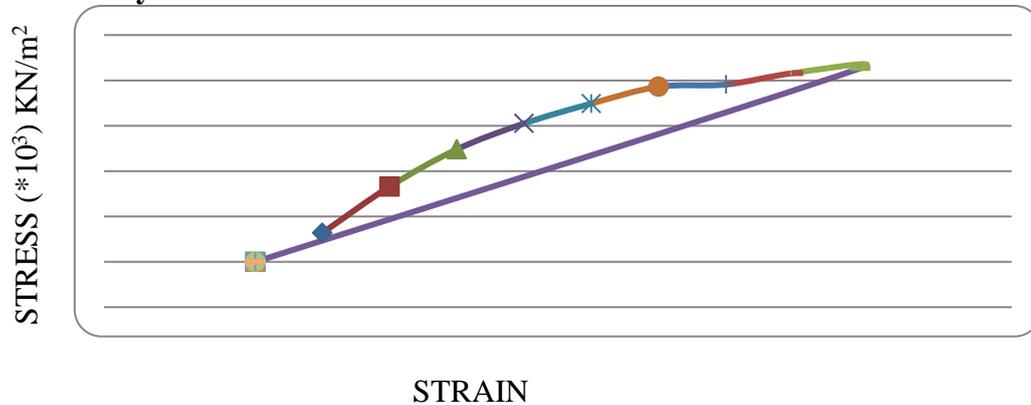
iii)lime 6.5%



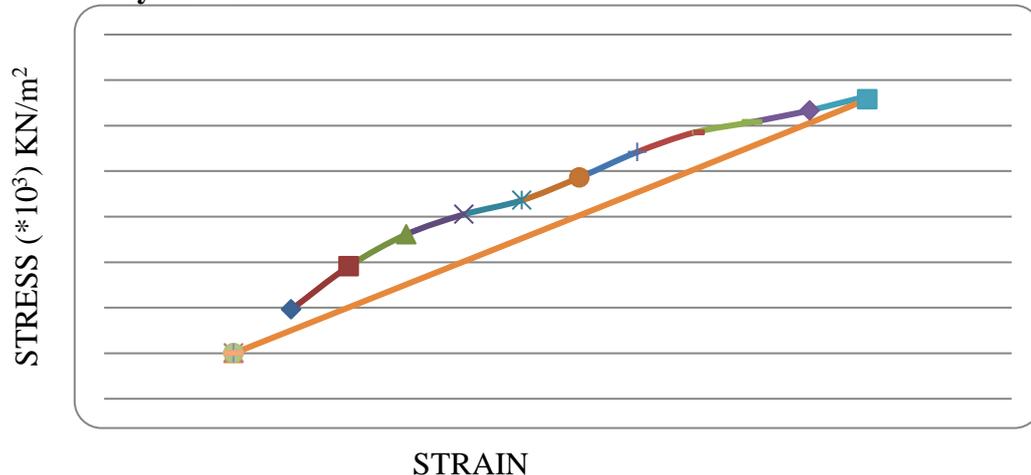
i) lime 4% + fly ash 20%



ii) lime 6% + flyash 20%



iii)lime 8% + fly ash 20%



11. Conclusion

Based on this experimental investigation stabilization of soil using fly ash, lime, mixture of fly ash and lime was concluded below

1. It improves the engineering properties of the soil
2. Gives improved stability when used in foundations.
3. Long-term durability over decades of service even under severe environmental conditions.

4. Strict quality control shall be exercised with regard to quality of its natural moisture content density and moisture content after compaction, etc.

5. Adding of fly ash and lime in soil enhance its strength and compressibility.

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Economic Significance Of Women Education:- An Investigative Study On Bule Hora Town

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Abstract

The research was conducted in Bule Hora town to identify the economic importance of promoting women's education. So, the researcher discussed the trends of women's education, factors affecting women education and economic importance of promoting women education such as in decision making and quality leader ship, wise use of resources and to improve social welfare, in creating employment opportunity for others and in developing financial saving habit. The objective of the researcher was to assess the contribution of women education in influencing their economic aspects and to examine the attitude of people towards the importance of women education. The actual information was collected from concerned individuals, and administrative agents through direct observation, questionnaire, and interview questionnaire. Secondary sources include all types of various secondary materials like written documents, and journals is used in the analysis of about economic importance of promoting women education. The sampling technique used was simple random sampling and purposeful sampling technique. The researchers found that women make a significant contribution to the economy of Bule Hora town both through their production and reproductive roles. However, being physically weaker women were therefore also perceived as being less capable and requiring the protection and guidance of men.

Keywords; physically Active women participates in economic activities, promoting women's education, Cochran and strata techniques.

Introduction

Over 4.5 billion world population are engages in different economic activities among those women's are estimated 1.5 billion (UN, 2005). This figure show that they significant impact on the economy. The world has recognized the vital importance of education as a main aspect of security and as means to empower women in economic development. According to human development (UNDP) report, human in Africa represent 520% of total population, approximately the 75% on agriculture and produce 60 to 80% of food. This participation increase productivity to 20% in Africa and 50% developed nation (UNDP2008).

Almost to thirds of employed woman in developing counties are vulnerable jobs, as own-account or unpaid family workers (UN, 2009) as causal agricultural laborers at the bottom of a global value chain as a workers in urban factories and workshop as domestic servant. Structural and culture factors make it more difficult for women to access vocational turning program due to their giving responsibilities and societal expectation about which

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jobs are sustainable for them.(Jovenen scheme that was implemented in the Colombia from 2002 to 2005).

Bourguign and marisson (2002) examined how higher education on level lead to lower fertility rates by affecting per capital income growth and decreasing mortality rate per child also investigates the impact of gender inequality education and employment on economic growth in developing counties through 41 years period (1960 to 2000).

Gender inequality in education and employment can reduce economic growth, and also stated that reducing gender inequality would lead to economic development because, the education has a huge impact on fertility and the creation of human for the next generation.

Statement of the problem

Before one or two decades ago most women in Ethiopia do not get the opportunity to attend for school. Some of the woman completed primary education when they were young girls.

The general objective of education policy and its strategies of implementation indicate provision of primary education policy and its contribution for all citizens' improvement in equality and efficiency of education, encouragement of other sectors to participate in sector, and enhanced equity in gender (meskerem SH.2003).

The population of Ethiopia is increasing at higher rate; women reaction has direct bearing on population trends.

Women with low level of education cannot have better understanding on reproduction and contractive in use decision. They have on enough awareness about the benefit of the family Planning and higher opportunity cost of having many children .they also has limited knowledge on health system nutrition. Due to this, they have limit access in investment, saving and employment opportunity (mesfin mulu, 2012)

Empirical evidence shows that women have been play a great role in cultures political and economic activity. In addition to promoting women's education economic activity can help reduce poverty, wage difference, reduce income inequality, unemployment by creating job opportunity ,reducing fertility rates, promoting social welfare and economic development a whole(FWAB,2009). In this study area as per knowledge of the researches, some study has been conducting regarding to the economic importance of promoting women's education.

According to (Halkanoztune, zario and zehravildan series, 2014) the effect of female education on economic growth. And other researcher in Ethiopia 2014,by GashawAyferam under the title that assessment of the roles and constraints of women in economic development of Ethiopia a case of Ambo town, He concluded that women play a great role in economic development even if there are some constraints.

Literature Review

Education since immemorial has been an important investment in human capital and educated societies is reception to new ideas novelties that paves the way for innovations of various types.Education services as one means for populations to attain the anticipate social and economic change. For the conversion of national, physical and other resources into products demanded by the higher living standard of people and prepare conservation of exhaustible resource as for innovation and experiment, education in modern society. (IK: K, 1998, 25).

The quality of education in most developing countries is very low and while this condition exist rapidly growing population make quality of education to deteriorate even worse.

Africa is one of the least compared to other continents, the disparity between girls and boys (ECA 1996).

Adam Smith believed that economic progress was based of labor and that it raises supplies of human skills and demand for them. However, training the packages of wealth of the nation we come to Smith's analogies between man and machines, where acquisition of skills viewed specially as investment (Bens. Bernanke and Julio Roten berg, 1997)

Neo classical economists maintained that one of the causes for economic growth is improvement in the quality of labor through training and education. One of the arguments on the Harrod Domar macroeconomic growth of an economy which postulates a direct relationship between county rate of saving and its output growth (Todaro 1998).

There are several reason rooted in economic theory on why education effect fertility. First formal schooling may increase opportunity cost of child bearing and among educated women (Becker 1982 and Schultz 1994). Second education may lower fertility though improvement in child health and to reduced rate of child mortality (Schultz 1994).

Finally female schooling may affect fertility though the effective use of contraception (Rosenz wing and Schultz 1994). Educated women can learn more about contraceptive use effectively than uneducated women, reducing the number of anticipated pregnancies (Daniel 2000).

Ethiopia has a long history of education; the history of education, printing and publishing in Ethiopia is not nearly as long as that of language, script and manuscripts. Until the 20thc, the church was the only means of education in Ethiopia.

This served the limited purpose of spreading the Christian religion but could not produce mass literacy. Developments such as education and printing began under menelik, 1889_1913) who established the first school of Ethiopia in Addis Ababa. Higher education started in 1950 with the establishment of a university college in Addis Ababa ,The printing of Ethiopian works though started as early as printing it self but in Ethiopia began in 1863 at massewa. The first commercial printing press was introduced at massewa in 1890 (copy right ,1994 Academic press) and international information and library review, 1994.

The gender gap and the level of girl's education participation and performance are result of combined effects supply and demand factor and these interact policy, economic and social cultural environment (Arderman Eta kgs). Woman must be educated women can be a better human Bering, successful mother and responsible citizen. Educating women will definitely increase the living standard both at and outside home. An educated woman can fight against social evils such as domestic violence, dowry, low wages etc (International literacy day 2016 and Romadeeg Kaur, 2017).

Economic factor contribute a great deal for the disparity between girls and boy in school and other economic activities. These factors includes directs schooling costs opportunity cost and prospects of low economic returns family back ground and potential parental investment behavior. (B and M development consultant Plc).

Social cultural barriers that negatively affect education and economic contribution of women (girls) are numerous and commonly practiced. These includes: - marriage (early marriage), attitudes regarding girl's education religious and cultural perceptions of boy's superior ability (Colin Brock and Nadine communist, 2005).

Parental attitudes to word the importance of girl's education also affected their role in the economic activities. The like decision to send their children to school usually taken by parents, and this decision is party based on their perception of cost of benefits to schooling.

Parents are more likely to send boys than girls to school, particularly in situations where they are unable to afford to send all their children to school (IBID).

School-related factors include: - learning environment, distance from school, inaccessibility of schools and teacher attitude to girls, in elegance and teaching practices, techniques, school culture, quality of education, gender bias in the classroom etc (Dr. Ritort).

Ethiopia took the preparation of poverty reduction and strategic paper in 2007 and has already prepared the full PRSP. It was approved in 2002 and the country is now in its 5th year of implementation of SDPRP. The second one is under preparation (MOFED 2005 and Meskeremshferaw 2003). The objective of Ethiopian SDP is to reduce poverty by changing rapid economic growth while at the same time maintaining macro-economic stability. It is indicated that the real GDP was targeted to grow by at least 7% per annum (IBID).

The general objective of education policy and its strategies of implementation indicate provision of primary education for its citizens, improvement in the quality and efficiency of education, encouragement of other sectors to participate in the sector, non-formal education and hence equality in gender (Meskeremsh .2003).

Ethiopian education system has been changing a number of times when the government changes and resigns power.

During the Derg period, it was 6-2-4 at present the schooling set up has changed to 8 years of primary (1-4) lower primary and 5-8 upper primaries. In 2001/2002 for the student or teacher ratio was 65 in primary education. This was 15 more students per teacher compared with the standard set by MoE annual report as 50 students per teacher (MOE annual report, 2003/04).

Education expenditure is one of the useful indicators of development. The target for 2005 was to allocate 19% of the total expenditure. However the actual expenditure in 2002/03 is not given and it's difficult to see the increasing trend of expenditure, anyway, owing to the increase in the

Population, it seems that the governments still need to increase the education budget. Budgeting for education sector to meet economic growth and development (Ibid).

The total enrollment is increasing. The enrollment of primary education student target for 2004/05 was 65% of the school age children. The gender gap between girls and boys enrollment in 2005, i.e. 57% and 72.8% respectively has been passed in 2002/03 (Todaro 1997).

The gender policy of the country indicates the government to abolish the gender disparity at all levels no later than 2015 (Meskerem 2003) gender disparity enrollment is very high.

Girls' enrollment in Ethiopia is mainly affected by insecurity, culture, beliefs, sexual harassment by male colleagues and teachers. In addition the long distance travel from home to school, in rural areas, makes them vulnerable to rape, early pregnancy and sexually transmitted diseases (Jane on song :- gender issues search report series number: 22)..

Objective of the study

- To analyse the contribution of women education on economic expectations
- To identify the factors that hinder women education.
- To determine the attitude of people towards the importance of women education.

Research Methodology

The actual information was collected from concerned individuals and administrative agents. The main streams of data are primary and secondary sources. The primary source is the original information which get from its sources like interview face to face questions, telephone communications, and secondary source which involves some types of published and unpublished materials about economic importance of promoting women's educations, these including data from reports, economic journals and data from previously research done.

The data were collected through face to face interview of individual's respondents, and administrative bodies, and by using questionnaire. Questionnaire is the simple way in which gathering information from respondents through distributive paper questions in order to meet the target point in our research.

The target population for this study would be active female population which participates in economic activities and on educations in BuleHora town. Simple random sampling necessary for the study, because of the fact that the town has different socio economic activities and also in order to reduce unbiased sampling. The total population of women physically actives are 8645 in town. And the town has three kebeles 01, 02 and 03. Purposively 01 and 02 were selected.

The sample size calculated by using Cochran, (1963),

$$n = p (1-p) z^2/e^2$$

Where; n is sample size

p = is proportion of population

Q = 1-p is the probability of random sampling

e = is estimated error term

z = is standard normal distribution

So, kebele 01 has total population 3833 and kebele 02, has total population 2700.

$P = \frac{\text{Total number of population selected in each kebele}}{\text{Total population number of physical active women in town}}$

$$= \frac{6533}{8645} = 0.7556$$

$$Q = 1-p = 1-0.7556$$

$$= 0.2444$$

$$e = 10\% = 0.1$$

$$z = 1.645(90\%)$$

$$n = 0.7556(0.2444)1.645^2/0.1^2$$

$$= 49.97 \text{ or } 50$$

The stratum is also as follow;

$(nj/N) n$ = sample size from both kebele

N = total number of population in both kebele

n = total sample size

The calculated sample size used from both kebele as follows; from kebele 01 = $(3833/6533)50 = 29$

From kebele 02 = $(2700/6533)50 = 20.66$ or 21

So, the researchers distributed 29 and 21 questionnaire to kebele 01 and 02 respectively.

The data would be analyzed in the form of statement in which expressed through descriptive analysis. In details table which contain grouped units, variables and graphs

used. Graphs is the bar stick which shows the needed information in organized form. And also by pie chart the figure in circle expression.

Data Analysis and Discussion of Results

4.1. The Age Distribution of the Respondents

According to the study result, the age ranges out of the total respondents, 3(6%) of them were between 15-20 years' age, 10(20%) of them, Were 20-25, 25-30 and 35-40 years' age and the remaining age group of respondents were between 40-45 and 45-50 which account for 8% and 10% respectively. As we observed from the finding, the largest proportion of the study population lied between age group of 20-25, 25-30 and 35-40. For women whose age is 15-20 and who are productive in economic activities the percentage distribution in age is as small as only 6%. On the other hand, women whose age is above 40 years are relatively small.

TABLE 1. Distribution of Bule Hora town reproductive age group women

Age range (X)	Frequency (f)	Percentage (%)
15-20	3	6
20-25	10	20
25-30	10	20
30-35	8	16
35-40	10	20
40-45	4	8
45-50	5	10
Total	50	100

Source: Primary Survey, 2017

4.2 Access and Coverage of Women Education Bule Hora Town

Even though Bule Hora town has enough primary school as compare with other rural areas, the illiteracy rate is high but it is the worst for women. This is because of women have no access to education due to cultural, economic and social reasons. The following table 2 shows the result of data collected from Bule Hora town women.

TABLE 2. Distribution of respondents by education level in BuleHora town

Variables	Frequency (f)	Percent (%)
Illiterate	10	20
Read and write	11	22
Primary education	14	28
Secondary education	10	20
College and universities	5	10
Total	50	100

Source: Primary Survey, 2017

Regarding education level, the study result revealed that the number of women who are illiterate is still as large as twenty percent (20%). This is because of lack of awareness, traditional outlook, religion view, abduction, rape, early marriage and forced marriage in the study community. On the other hand, the number of girls in primary school is high (28%) than secondary school (20%) and the number trend of female pupils decreased when the grade level increased. The area is characterized by limited secondary schools so that those students who have attended the second cycle of primary school face a challenge to continue for further education. Because of this and the above problems girls are required to

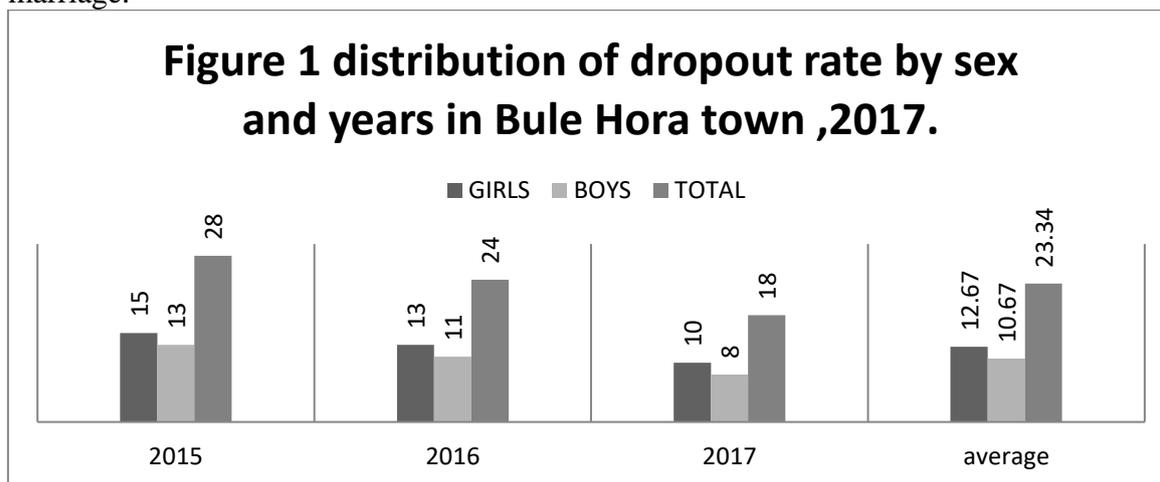
stay at home with their parents because the family does not allow girls to leave home and live in town nearest to the school. The other possible explanation for large number of illiterate women is lack of money to pay for school expenses, the unwillingness of parents to send their daughters to school, the unequal attention given to daughters by parents etc.

4.2.1. Dropout Rate

Dropout rate of school may emanate from socio-economic and cultural factors. It is a good indicator of the performance of female education in all level of schooling.

From the following figure, regarding dropout rate of girls and boys at high school for three consecutive years, the dropout rate is higher for girls than boys. The figure shows that the average of dropout rate for girls and boys are 12.67 students and 10.67 students respectively. This is an indicator that girls stay more than boys at school if they get the chance to be enrolled. However, the higher dropout rate of girls compared to boys does mean that discontinuing of learning is a problem for girls.

The other possible for girl's dropout rate is repeating in the same grade that may discourage female pupils to spend another year, very low income of parent, and early marriage.



Source: Education office, Bule Hora town, 2017.

4.3. Income Level of Respondents of Bule Hora Town

TABLE 3. Distribution of monthly income of respondents in Bule Hora town

Income level	Frequency	Percentage (%)
Less than birr 150	2	4
150-500	9	18
500-1000	13	26
1000-1500	17	34
1500-5000	9	18
above5000	0	0.00
Total	50	100

Source: Primary Survey, 2017

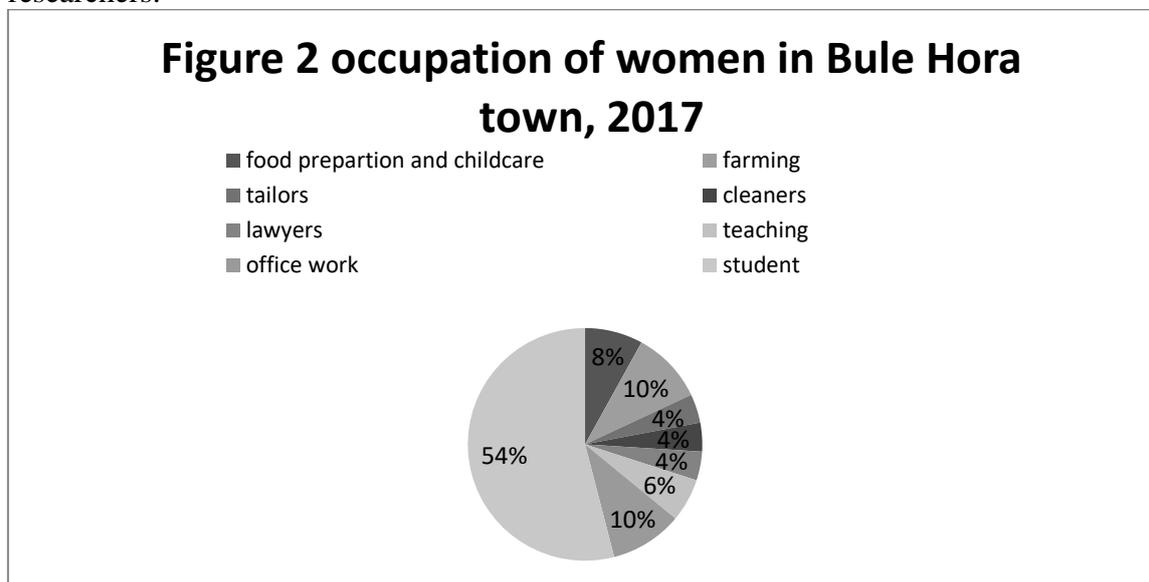
The study result revealed that the number of women who were earning monthly income of less than birr 150 is about 2(4%) of respondents. These groups of women are those who wait for the help of others in order to undertake their daily activities such as those who are learning full time. On the other hand, the number of women who are earning monthly income of 150-500 is 9 (18) of sample respondents. These groups of women were those

who are learning at school and earning low income because of seasonality of work and unproductively of their work. On the other hand, the number of women who were earning monthly income of 500-1000 was 13(26%) of respondents.

These groups of women were those who were giving service in cafes, and women who were earning low income because of their low educational level. Women who were earning monthly income of 1000-1500 was 17(34%) of respondents. These were those women who were government employee and who were doing in shops and markets as retailer. On the other hand, the number of women who were earning monthly income of 1500-5000 was 9(18%) of respondents. These groups of women were those who were in the shops and markets as whole seller and government employee with higher educational level and in higher position. Unfortunately, the number of women who were earning monthly income of above 5000 was not found during data collection.

4.4. Daily Activity of Women in Bule Hora Town

Most women in Bule Hora town do not engage income generating activities. Their income was lower than those gained by men. Mothers who have infants claimed that they did not have time to engage in come generating activities due to childcare. The most common activity in which the women of the village usually engage was food preparation in home which accounts for about 54%. Some women also work on their farm either co-work with their husbands or lonely. This account for about 10% of sample respondents; generally the following figure shows the daily activity of Bule Hora town women in 2017 by the researchers.



Source: Primary Survey, 2017.

4.5. Violence against Women and the Attitude of People towards Women Education

Research has determined traditional beliefs regarding the ideal roles of women in society. Traditionally, the only roles available to women were those of wives and others. Women were thus seen as nurtures and mainly as providing support for men who worked to provide for the family. Being physically weaker, women were therefore also perceived as being less capable and requiring the protection and guidance of men.

These attitudes have prevailed even in current times when socio-economic changes have resulted in changes to roles women are now expected to undertake. Socio-economic

changes have made education necessary, not just for the purposes of providing income earning opportunities, but also for the potential to contribute to the improvement in the standards of living of individuals, families and communities.

These traditional beliefs have been found to foster negative attitudes which limit family and community support for girls' education. The perceived ideal roles and characteristics of women and girls influence how girls and boys are socialized in the home, community and school. Because girls and women in general are considered physically weaker and less capable than men, they are often protected and supervised to keep them from what is considered threatening to their safety i.e. physical, sexual, mental and emotional safety.

Where schools are situated long distances away, parents also worried about their daughter's safety while traveling to and from school. This view was also the reason why many parents were reported to be reluctant to allow their daughters to attend extra-tuition after school as in most cases the teachers involved are men and as these sessions are usually held in the evening, parents also reluctant to let their daughters travel late.

4.6. Contribution Of Women's Education in Bule Hora Town

Women make a significant contribution to the economy of BuleHora town, both through their production and reproductive roles. Since women constitute a significant share of the population in the town their contribution for development has significant effect on the economic, social and political affairs of the town. Bule Hora town increase productive capacity of women thereby increasing opportunity for wage employment or shifting from marginalized to highly productive activities. It also makes them aware systems.

Family planning and a large control over their resource, Women as human capital are one of underutilized resources in the town. Sustainable economic growth at national and global levels depends on women joining the labor force and higher use being made of their skills and qualifications. More working women would also help offset the negative effects of rising fertility rates and ageing populations. The rate of female participation in the labor force is significantly lower than that of men. In general the various economic importance of women education such as creating saving habit, in decision making and quality leadership, improving welfare and wise use of resources, in developing family planning techniques, and creating employment opportunity for others.

TABLE 4 . Contribution of women's education in Bule Hora town

Importance	Illiterate in No	Percentage (%)	Literate in No	Percentage (%)
Develop family planning	3	30	15	37.5
Develop saving habit	2	20	8	20
Develop wise of resource and improving welfare	3	30	7	17.5
Decision making and quality leadership	1	10	8	20
Creating employment opportunity for other	1	10	2	5
Total	10	100.00	40	100.00

Source: Primary Survey, 2017

According to the field survey of the researcher 30% of respondents among illiterate and 37.5% respondents among literates answered the importance of women education as

making aware of family planning. This indicates that the awareness of the town's women (both illiterate and literate) about family planning is relatively better.

Family planning is an important component of safe motherhood initiative that has received increased attention widely in Bule Hora town.

10% of respondents among illiterate and 20% of respondents among literates answered the importance of women education is enabling them to make wise decision and quality leadership. This indicates that the awareness of the town's women (both illiterate and literate) about leadership and management in appreciate able more or less.

There is dramatic increase in the number of women students in Bule Hora town. However, most academics and academic leaders are male and, even where there are marked increases in the representation of women in particular job.

Education is humanity's best hope and most effective means in the quest to achieve sustainable development. Education plays important roles in building a harmonious and sustainable society.

(10%) of respondents among illiterate and (5%) of respondents among literates answered the importance of women education as enabling them to make employment for others. This indicates that the awareness of the town's women (both illiterate and literate) about education as a means of job opportunity for others is not appreciable in the Bule Hora town.

Gender equality is central to economic and human development. Equal opportunity for women and men supports economic growth and helps to reduce poverty.

When girls are educated it lower fertility rates, reduce maternal mortality, and improves the health of their children. When both women and men have access to economic opportunity it helps their families prosper, and the country's economy grow.

20(%) of respondents among illiterate and (20%) of respondents among literates answered the importance of women education as enabling them to be aware of about saving and investment activities. This indicates that the awareness of town's women (both illiterate and literate) about education as a means of creating awareness about modern financial institution is relatively appreciable in the town.

At the household level women are more likely to spend money improving their family's welfare.

30% of respondents among illiterate and 17.5% of respondents among literates answered the importance of women education as enabling them to be aware of about wise use of resources and gradually improve their well-being. This indicates that the awareness of town's women those are illiterate about education as a means of creating awareness about use of resources is relatively appreciable than those who are literate in the town.

If women are educated, they can effectively participate in the economic activity or economic development of that society and can efficiently use the resource equally with men, thus can improve well fare and wise use of recourse.

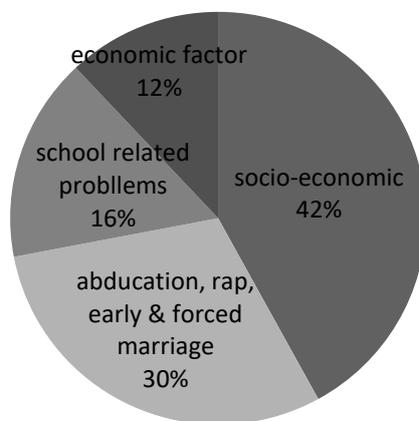
4.8. Factors Affecting Women's Education in Bule Hora Town

There are different factors which are responsible for the low participation of females in all levels of education. These factors can be classified in to socio-cultural factors, abduction, rape, early and forced marriage, economic factors, and distance of school and the community attitudes.

The following figure shows the factors affecting women education in Bule Hora town in year 2017 collected by researcher.

Socio-cultural constraints that negatively affect the education of girls are numerous and commonly practiced. These include lack of awareness, traditional outlook, religious views, cultural perception of boys' superior abilities, poor performance of girls on examination, and parental attitude towards girls' education. The below figure shows that about 42% of the respondents face socio-cultural problems, which in turn indicates the above mentioned problems are deep rooted in the town.

Figure 3 factors affecting women education in Bule Hora town in year 2017



■ socio-economic
■ abduction, rap, early & forced marriage
■ school related problems
■ economic factor

Source: Primary Survey, 2017

Socio-cultural and religious factors, such as initiation ceremonies and gender socialization are additional factors responsible for pupils' failure to complete primary education. In areas where traditional circumcision is still practiced, some pupils are pulled out of school to participate in initiation ceremonies.

Forced and early marriage deprives women and young girls of their basic human rights. Forced marriage describes a marriage that takes place without the free or valid constant of one or both of the partners and either physical or emotional threat.

Early marriage is related to forced marriage because minors are deemed incapable of giving informed consent. Forced and early marriages are serious human rights violations.

Abduction, rape, early, and forced marriage has also been identified as one commonly practiced type of violence against school girls and the town in general.

Form the above figure; it is possible to say this problem stand next to socio-cultural factors, which is 30%. This is one of the strong that discourage parents not send their daughters to school.

This include learning environmental, distance from school, teacher's attitudes towards girl's intelligence, teaching practices and techniques, quality of education, and gender bias in the class room. The above figure shows that the distribution of this problem is about 16% out of total number of respondents selected. This indicates the problem was less

comparing with socio-cultural, economic factors and abduction, rape, early and forced marriage.

Economic factors contribute a great deal to the disparity in girls and boys in school. The main factors include direct schooling costs, prospects of low economic return, family background and parent's investment behavior. From the above figure, it is visible that the number of women facing economic is six (6) out of fifty respondents, this account around 12% among the problems prevailing in the town.

Conclusion and Recommendation

From the study so far, it is possible to conclude that Bule Hora town women have limited access and performance in their education due to economic factors, socio-cultural factors, school related pregnancy, overloaded works and even treated as inferior on economic development as well as fertility. Even after controlling other relevant factors, the education of women stands out as an important factor in determining the country's development.

For more advancement of female life, there be education which is not segregated in age or gender, so as to increase the educated girl's in our society for the sustainable development of our entire society in all aspects of life such as social, economic, political aspects of life. According to the own survey of the researchers, women's education has a great role to make them aware habits, to develop family planning techniques, to make them wise users of resource and improve their welfare, to create employment opportunities for others and to enhance them in best decision making and quality leadership.

Based up on the data analysis conclusion, the following recommendations are forwarded;

- ❖ The government should increase the number of qualified female teachers to create a sense of self confidence in female students and to attract them to education and to be encouraged in school.
- ❖ The government should make a great effort to give periodic training for parents in order to avoid socio-cultural problems that restrict female participation in the education and bad attitude of society towards women creativity
- ❖ The government and non-governmental organizations need to increase their effort in expanding non formal education programs since the majority of Bule Hora town women didn't get the opportunity to attend formal school.
- ❖ Parents should try decrease the work load of girls at home to enable them to spend more time for their studies.
- ❖ Generally, as researchers we want to recommend that the government and non-government organization should work on avoiding external and internal problems like lack of vision, lack of self-confidence of women on themselves.
- ❖ "Give a pen, she change the world!!"

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ICT @ School in Jharkhand

DR.SUCHITRA BEHERA*

Abstract:-ICT for education and ICT in education suggest the development of ICT particularly for teaching and learning purpose and ICT in education includes the adoption of general parts of ICT in the instructional process. The emergence of ICT has transformed the activity of contemporary man particularly in the setting of globalization. The educational field has been influenced by ICT. ICT has the strength to speed of improve and extend aptitude reforms as it has the capacity to bust teaching by inspiring and engaging learners. It helps schools to reform assists and understanding the fictional practices. It offers a totally new and advance learning environment for learners. ICT in schools gives a chance to instructors to change their practices by furnishing them with enhance educational content and more powerful educating and learning techniques. Present study focused on to find out the programme implemented ICT@ school in Jharkhand and impacts on teaching learning process, schools personnel's and students.

Key Words: (Information, communication, technology, innovation, teaching, learning.)

Introduction

Innovative ideas are appreciated and accepted for the benefit of human civilization. It makes the activity more interesting and unique one. The act or process of introducing new ideas, devices or methods is called innovation. Now days in all field innovations are implemented. In teaching learning process innovation are widely accepted. These are the very effective means to teach the new and complicated ideas. Innovations in teaching learning process means the practice of effective and meaningful teaching by the educators thoughtfully experiment and applying new or different pedagogical approaches, technologies for curricular enhancement, course design and organization and assessment. A teaching method comprises the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learners. There are so many innovative teaching methods are used in the class room like: creative teaching, use of audio visual aids, real world learning, brain storming, classes outside the classroom, role playing, storyboard teaching, stimulating classroom environment, utilization of hobbies, team teaching, puzzle and games, school clubs and ICT.

Information and communications Technology commonly termed as ICT comes from the acronym IT and CT refers to Methods of storing, manipulating and communicating information. IT is a general term used to describe any technology that helps to produce, manipulates, stores, communicates or disseminates information. It is the most expensive complex computers, with devices usually dealing with electronic data in binary format. Communication Technology (CT) is the term used to describe telecommunications

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equipment through which information can be sought and accessed examples video conferencing, Tele conference, phones and modems.

Now a day's educational systems are adopting new technologies by integrating IT and CT as ICT in the teaching and learning Process.

- It prepares students with the knowledge and skills they need in their subject matters.
- It makes the teaching profession evolving from teacher centered to child centered.
- ICT integration makes the curriculum transaction easier.
- ICT facilitates not only the delivery the lessons but also the learning process itself.
- This includes computer based technologies ,digital imaging , the internet ,files servers , data storage devices, network infrastructures desktops, laptops and broadcasting technologies namely Radio, television, smart class and telephone which are used as instructional tools at schools.

INPUT SOURCES	OUTPUT SOURCES	OTHERS.
Visualizer /Documents/Camera Student response system Slate/Tablets Application software	Projectors, Inter active whiteboard Display Monitors TV Etc.	Digital Camera P. C Switcher Digital Recorder Other technology

ICT in education means teaching and learning with ICT. ICT tools can be divided into three categories

Worldwide research has shown that ICT can lead to improve students' learning teaching methods better. A report made by the national institute of multimedia Education in Japan proved that in student exposure to educational ICT through curriculum integration has a significant and positive impact on student's achievement, especially in terms of knowledge comprehension, practical skill and presentation skill in subject areas such as mathematics, science and social studies.

It is a new vision in education. The use of educational technology can bring a huge change in education. Internet and E- learning devices can make class room environment more interactive. In these days smart class and smart school are very interesting dreams for students, teachers and students. Students are very interested about the smart school and smart class. Several institutes are making their class room smart and modern. They are working on smart school projects.

Smart school and smart class is an innovative concept in education. We are living in the age of internet, so our education system is also going to be online. E –learning and on line education is the need of this time.

Project

The ICT @ School's scheme is a window of opportunity to the learners in the Government secondary and sr. secondary schools in the country to bridge the digital divide. Government of /India has sanctioned .ICT@schools programme to be implemented in 465 schools of Jharkhand. The objective of the project is.

- a) To establish an enabling environment to promote the usage of ICT especially in rural areas. Critical factors of such and enabling environment include wide spread availability of computers infrastructure, internet – broad band connectivity and promotion of ICT literacy.

- b) To ensure the availability of quality content online and through client server architecture.
- c) Enrichment of existing curriculum and pedagogy by employing ICT tools for teaching and learning.
- d) To enable students to square skills needed for the digital world for higher studies and gainful employment.
- e) To provide an effective learning environment for children with special needs through ICT tools.
- f) Promote critical thinking and analytical thinking and critical skills by developing self-learning skills of the learner leading to student centric learning.
- g) To promote the use of ICT tools in distance education including the deployment of audio visual medium etc.

Objective of the study

Objective of the study are as follows:-

- a) To know the ICT programme at the schools in Jharkhand.
- b) To understand the procedure of ICT at the school programme.
- c) To find out the impact of ICT on teaching learning process.
- d) To find out the impact of ICT on the teachers and others school personals.
- e) To find out the impact of ICT on students.

Research questions

Following research questions are formulated for the study

- 1) What is ICT programme at the schools of Jharkhand?
- 2) How the programme of ICT is implemented in schools?
- 3) Is there any impact of ICT on teaching learning process?
- 4) Is there any impact of ICT other school personals?
- 5) Is there any impact of ICT on students?

Methodology

Methodology covers the design of the research, selection of the representative samples, applying appropriate research tools and techniques collecting relevant data and analysis. A survey method with aptitude scale for students is implemented in this study.

Sample of the study

The sample of the study comprise schools using ICT of Kolhan region consisting Purbi-Singhbhum , Paschim-Singhbhum and Seraikella-kharswan district of Jharkhand.300 students of the schools are selected as sample from the population.

Tools and Techniques use

Self-made rating scales are used to collect the data from the students and the teachers of the selected schools.

Analysis and Interpretation

About ICT Programme

The ICT@school scheme is a window of opportunity to the learners in the govt. secondary and senior secondary schools in the country to bridge the digital device. Government of India has sanctioned ICT@schools programme to be implemented in 465 schools of Jharkhand as a pilot project. The schools are divided in four zones. The project is to be implemented on 'BOOT' model in each school failing in particular zone for initial period of 5 years. Two service integrator /agency are selected through e-tendering process. The

EDUCATION AND SERVICES LTD is selected to implement in zone 1 and zone 2 schools, THE RICOH INDIA LTD is selected to implement in zone 3 and zone 4 schools.

Implementation of the Programme

The following procedure is the process followed by the schools to implement the programme

Role Of Agency: a. Establishment of ICT lab which include supply, Installation and maintenance hardware and software items in the school. The agency will maintain the hardware, software and connected accessories in proper working condition throughout the contract period.

b. To provide man power and other services for successfully running of ICT lab.

c. Teacher training as per the guideline of ICT@school scheme and /or any guideline received time to time from state/central government. Agency will impart teacher training in Hindi as the medium of instruction.

d. The agency will pay for the electricity consumption made by the computers and accessories used in each school under this contact. When electricity is not available the bidder will ensure minimum four (4) hours of generator support per working day.

e. On –site warranty for computer hardware, software and connected accessories covering the contract period of 5 years. And the removal of virus from the hardware items. To establish helpdesk facilities for the redressal of operational difficulties JSEPC may appoint third party agency for inspection and audit to measure the success of the project during the tenure of the project.

f. monitor the implementation of the scheme at the school level, install MIS software provided by JSEPC and submit periodical reports and also submit quarterly performance reports to the department.

So the agency is responsible for adequate care safety, security like insurance in respect of the all materials supplied to schools.

Providing Training to the Subject Teachers

Objectives of Training

- I. The trainee becomes capable of using computer for normal operation and installing, operation and using the software.
- II. The trainee should be able to make his/her own lesson plan using the **MIS** software developed by the bidder and using the internet facility available in the school.
- III. The training should be hands on with the help of computers and software (educational) developed.
- IV. The training should include presentation/discussion on the topics by subject experts also.
- V. A 'teachers' manual should be made available to all the trainees.
- VI. Expected set of questions/answers should be provided at the end of the training.

Training Delivery

The training shall be conducted at district level and duration of training is as follows:

A. Induction Training

First time induction training should be provided to all teachers/selected teachers in ICT the selected schools. The average number of teachers per school for the district will be 10.

- i. Total number of training days-10@ minimum of 6 hour training per day.
- ii. The training must cover-
 1. Introduction session.

2. Computer overview.
3. Operating system.
4. Productivity suits and integration of power point in class room teaching.
5. Office suite.
6. Internet / Email/ browsing etc.
7. Classroom learning and teaching tools- projector/collaborating networking etc.
8. Assessment and feedback. III. 1:2 computer ratios should be mentioned for very

training programme.

B. Refresher-training

Refresher training in use of ICT in teaching should provide to all teachers/selected teachers in the selected schools. The average number of teachers to be trained per district will not exceed 10.

- I. Total number of training days 5@ minimum of 6 hours training per day.
- II. The training must cover-
 1. Working with multimedia.
 2. Making and editing movies, pictures, images etc.
 3. Overview of web applications.
 4. Internet and e communications.
 5. Overview of management information system.
 6. Legal and ethical aspects of web based information.
 7. Computer technologies and security.
 8. Search optimization.
 9. Classroom learning and teaching tools.
 10. Overview of personalized learning.
 11. Assessment and evaluation.
- III. 1:2 computer training ratio should be mentioned for every training program. C.

Training module:

The agency will have to get their training module rectified by the technical advisory panel of the JSEPC or agency authorized by JSEPC.

- I. At least 10 teachers from each school needs to be trained.
- II. Each training programme will have maximum 30 persons.
- III. JSEPC will provide training space for the training of teachers. Other necessary infrastructure such as computing equipment's and other arrangements would be provided by the bidder.

ROLE OF JSEPC/DISTRICT/SCHOOL:

- a. Separate room for computer lab required to install all computer systems will be provided by the Government /school free of cost.
- b. School will provide single -phase power connection to the ICT lab.
- c. District will provide training space for the training of teachers. Other necessary infrastructure such as computing equipment's and other arrangements would be provided by the bidder. The bidder will have to also provide the requisite faculty and other learning resources required for the effective conduct of training.

Prime Roles and Responsibilities

The responsibility for the management of the programme goes to school Coordinator, District Co-coordinator and state co-coordinator. Their roles and responsibilities are given below.

School Coordinator (SC)

1. Training students and if required teachers on IT skills as per the school syllabus and time table.
2. To keep all the hardware and software in operational condition , on the spot training and hand holding of the enable the teachers to use the computers for computer teaching and also using educational e-content for computer Aided Learning .
3. To arrange the fuel for the Genet in case of electricity failure.

District Coordinator

To review school coordinators on their performance

To provide technical support to school coordinators

To verify maintenance the registers to verify equipment uptime

To collect and verify all reports to coordinate maintenance the work by vendors.

To send periodical reports to regional office

To collect sign –off from school coordinator for the District.

To review school performance in consultation with head master.

To participate and discussion with HM about education delivery.

To conduct education delivery reviews

To recruits school co-coordinators.

To conduct training programmes

State Co-coordinators'

State coordinator is the in-charge of the complete project management from the bidder.

To ensure smooth implementation of the project.

Monitoring of the performance of the school instructors and district coordinators.

Infrastructural Maintenances .Conduct monthly review meets with the district coordinators.

Vender management to ensure the machines are has high uptime.

To visit schools on regular basis to check execution.

To get the desired data, reports on time send to the education department.

To schedule faculty induction and technical training.

Send monthly reports to head office and participate in the monthly review.

This is the procedure to implement the ICT programme in schools. The infrastructural facilities are provided by the schools, the machinery equipment's are provided by the govt. through the agency. State level coordinator, District coordinator and School level coordinators manage the programme.

3. ICT makes the teaching learning process effective and interesting. It facilitates the learning process by audio-visual learning material, interactive classroom situation, interesting teaching materials, effective communication process to the learners. It shows a positive impact on teaching learning process.

4. The training programme provided at district level enhances the ICT competency of the teachers. A teacher uses the interactive board for their teaching process with the help of ICT. There are two classes for each subject is provided at ICT lab. Now it is compulsory for the teachers to take at least two classes per day in their subject. During the visit to the schools it was also find out that some teachers are hesitate to take the classes through ICT. They thought that the traditional process is better for the teaching. The other school personnel's use the computer for other day to day activities like drafting of letter, maintenance of records, evaluation records ,etc. it is the better way to store the data in a small folder. This habit should be improved by the school personnel's.

5. The total programme revolves around the students. It emphasis to make every students technology competent. This programme also facilitates the teaching learning process, when teaching learning process is facilitated students also facilitate. It is also observed that student's classroom achievement is increased through ICT classroom. Again it was finding that the positive mean score towards ICT is greater than the negative mean score of ICT. Which is (52.65 for positive impact), (32.92 is for negative impact). So ICT has positive impact on the student's achievements, performance, and learning.

Findings of the Study. The interpretation and analysis shows the following findings.

1. ICT programme is the project undertaken as the pilot project at secondary level to develop technological knowledge of the students, as well as interesting teaching learning process.
2. The programme is implemented from state level to the school level. State level coordinator, district level coordinator, and the school coordinator are allotted works as per their area. And the state level agency provides the equipment's of ICT lab with maintenance. So all the personnel's are perform their duties and responsibilities for effective running of the project.
3. There is positive impact of ICT on teaching learning process. It makes the teaching learning process easier and interesting.
4. There is positive impact of ICT on school personnel's. They use it for their day to day official work as well as in teaching learning process also.
5. There is positive impact of ICT on the students. Their classroom achievement is facilitated through the ICT classes. They also develop their technological skill using ICT.

Suggestions

ICT@ school is the new programme for secondary level in Jharkhand. So it requires more times for spread it.

ICT programme should be launched at the primary level.

ICT required more number of competent teachers so training programme should be available to all the teachers of the schools.

ICT should be launched in every secondary schools of Jharkhand.

ICT requires accessible internet facility, electricity facility; better lab condition should be developed in Jharkhand. The remote location schools will get benefitted through this.

ICT for all should be the motto of this programme

Conclusion

ICT programme at the school level is the effective means for the development of the state as well as for the country. There is the responsibility of every person to facilitate this programme. There is a proper monitoring and care is required to get rid of its negative impact.

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विविध स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास

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सारांश— प्रस्तुत संशोधनात, प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान सहाय्यस्थितीतील सहसंबंधाचा अभ्यास करण्यासाठी सर्वेक्षण संशोधन पद्धतीचा अवलंब करण्यात आला आहे. सहेतूक नमुना निवड पद्धतीने प्राथमिक स्तरावरील ५०, माध्यमिक स्तरावरील ५० उच्चमाध्यमिक स्तरावरील ५० व महाविद्यालयीन स्तरावरील ५० असे एकूण २०० शिक्षकांची निवड करण्यात आली होती. माहितीचे संकलन करण्यासाठी डॉ. एस. के. मंगल यांची प्रमाणित 'Mangal Teacher Adjustment Inventory' (MTAI) (Short Form) शोधिका व डॉ. मीरा दिक्षित यांची प्रमाणित व्यवसाय समाधान शोधिकेचा अवलंब करण्यात आला होता. विविध स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यासासाठी संकलित माहितीचे अर्थ पिअरसन यांचा सहसंबंध (r) गुणकाद्वारे करण्यात आली आहे. प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात वैध व विश्वसनीय सहसंबंध आहे.

Keywords:- समायोजन, व्यवसाय समाधान, अध्यापन, सहसंबंध

प्रस्तावना

शिक्षक हा शिक्षणप्रक्रियेला चालना देणारा महत्त्वपूर्ण घटक मानला जातो. शिक्षकांवर भारताचे भविष्य अवलंबून आहे. शिक्षकाला आपले कर्तव्य पार पाडणे गरजेचे असते. शिक्षकाने आपल्या अध्यापनातून विद्यार्थ्यांच्या चारित्र्याला घडवायचे असते. विद्यार्थ्यांना सक्षम करावयाचे असते. विद्यार्थ्यांना देशाच्या उपयोगी होण्यासाठी तयार करावयाचे असते. शिक्षक समाजाच्या विकासाला, राष्ट्राच्या विकासाला कारणीभूत असतो. त्याच्या मूल्यवान विचारातून आणि शिक्षणातूनच विद्यार्थी घडत असतो. शिक्षकावर अनेक जबाबदाऱ्या असतात. त्याचबरोबर त्याला स्वतःला अनेक गोष्टींची बंधने पाळावयाची असतात. शिक्षक स्वतः सक्षम असला तरच तो विद्यार्थ्यांना योग्य ज्ञान देवून घडवू शकतो. यासाठी त्याचे आपल्या अध्यापक जीवनात आणि वैयक्तिक जीवनात समायोजन साधने महत्त्वाचे असते. सामाजिकरूढ मानसिक, भावनिक आणि शारीरिक समायोजन होणे अतिशय महत्त्वाचे आहे. असमायोजित शिक्षक विद्यार्थ्यांना योग्य न्याय देवू शकत नाही.

समायोजनाप्रमाणेच शिक्षकांचे व्यवसायसमाधान होणेही महत्त्वाचे असते. पगार, अध्यापनासाठीचा वेळ, संस्थाकडून प्रोत्साहन, वाचनासाठी वेळ, विविध सेमीनार व कार्यशाळामार्फत ज्ञानवाढविण्यासाठीची संधी, सन्मान, कार्यभाराचे योग्य नियोजन, वेळापत्रक आदि बाबतीत शिक्षकांना समाधान होणे आवश्यक असते. शिक्षक समाधानी नसले तर त्याचा परिणाम अध्यापनावर होतो. परिणामी विद्यार्थ्यांच्या भविष्याचे नुकसान होते. म्हणून शिक्षक समाधानी असणे अतिशय महत्त्वाचे आहे. समायोजन आणि समाधान या शिक्षकांना आपल्या अध्यापनात उत्कृष्ट स्तरावर घेवून जाण्यासाठी योग्य बाबी आहेत. म्हणूनच प्रस्तुत संशोधनात विविध स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात काही सहसंबंध आहे का यासाठी करण्यात आले होते.

समस्याविधान— प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास करणे.

उद्दिष्टे

१. प्राथमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास करणे.
२. माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास करणे.
३. उच्च माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास करणे.
४. महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यास करणे.

परिकल्पना

१. प्राथमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून येत नाही.
२. माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून येत नाही.
३. उच्च माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून येत नाही.

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४. महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून येत नाही.

पद्धती— संशोधन पद्धत: प्रस्तुत संशोधनात प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सद्यस्थितीतील सहसंबंधाचा अभ्यास करण्यासाठी वर्णनात्मक संशोधन पद्धतीतील सर्वेक्षण पद्धतीचा अवलंब करण्यात आला होता. **जनसंख्या व न्यादर्श:** प्रस्तुत संशोधनात शिरपूर शहरातील प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावर अध्यापन करणा—या सर्व शिक्षकांची जनसंख्या म्हणून निश्चिती करण्यात आली होती. सहेतूक नमुना निवड पद्धतीने खालीलप्रमाणे शिक्षकांची निवड करण्यात आली होती.

अध्यापक	प्राथमिक शिक्षक	माध्यमिक शिक्षक	उच्चमाध्यमिक शिक्षक	महाविद्यालयीन प्राध्यापक	एकूण
	५०	५०	५०	५०	२००

संशोधनाची मापन साधने— शिक्षक समायोजन— डॉ. एस. के. मंगल यांची प्रमाणित 'Mangal Teacher Adjustment Inventory' (MTAI) (Short Form) शोधिकेचा अवलंब करण्यात आला होता. यात एकूण ७० वस्तुनिष्ठ प्रश्न होते. चाचणी पुर्नचाचणी तंत्राद्वारे .०६ इतकी विश्वसनीयता निश्चित करण्यात आली आहे. तर सप्रमाणता .८४ इतके आहे. **व्यवसाय समाधान शोधिका:** डॉ. मीरा दिक्षित यांची प्रमाणित व्यवसाय समाधान शोधिकेचा अवलंब विविध स्तरावरील अध्यापनाचे कार्य करणा—या शिक्षकांचे व्यवसाय समाधानाचे मापन करण्यासाठी करण्यात आला होता. या शोधिकेत एकूण ५२ विधाने आहेत.

संख्याशास्त्रीय परिमाणे— प्रस्तुत संशोधनात विविध स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यातील सहसंबंधाचा अभ्यासासाठी संकलित माहितीचे अर्थ पिअरसन यांचा सहसंबंध (r) गुणकाद्वारे करण्यात आली आहे.

संकलित माहितीचे विश्लेषण व अर्थनिर्वचन— प्रस्तुत संशोधनात विविध स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान शोधिकेला दिलेल्या प्रतिसादावरून पुढीलप्रमाणे शून्य परिकल्पनाचे परिक्षण करण्यात आले होते.

विविध स्तरावरील शिक्षक		संख्या	नमुना 't' मूल्य (०.०५)	प्राप्त 't' मूल्य	निर्णय	सहसंबंध
प्राथमिक शिक्षक	समायोजन	५०	.२८५	.५४१	त्याग	वैध व विश्वसनीय
	व्यवसाय समाधान					
माध्यमिक शिक्षक	समायोजन	५०	.२८५	.५९६	त्याग	वैध व विश्वसनीय
	व्यवसाय समाधान					
उच्चमाध्यमिक शिक्षक	समायोजन	५०	.२८५	.६४४	त्याग	वैध व विश्वसनीय
	व्यवसाय समाधान					
महाविद्यालयीन शिक्षक	समायोजन	५०	.२८५	.५६९	त्याग	वैध व विश्वसनीय
	व्यवसाय समाधान					

निरीक्षण व अर्थनिर्वचन

- **परिकल्पना क्र. ०१:** स्वाधीनता मात्रा (df) ४८ साठी ०.०५ सार्थकता स्तरावर प्राप्त 't' मूल्य .५४१ हे नमुना 't' मूल्यापेक्षा (.२८५) अधिक आहे. म्हणून शून्य परिकल्पनेचा त्याग करावा लागेल. यावरून असे दिसून येते की, प्राथमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून येतो. प्राथमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात धनसहसंबंध असून तो वैध व विश्वसनीय आहे.
- **परिकल्पना क्र. ०२:** स्वाधीनता मात्रा (df) ४८ साठी ०.०५ सार्थकता स्तरावर प्राप्त 't' मूल्य .५९६ हे नमुना 't' मूल्यापेक्षा (.२८५) अधिक आहे. म्हणून शून्य परिकल्पनेचा त्याग करावा लागेल. यावरून असे दिसून येते की, माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध

आढळून यतो. माध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात धनसहसंबंध असून तो वैध व विश्वसनीय आहे.

- **परिकल्पना क्र. ०३:** स्वाधीनता मात्रा (df) ४८ साठी ०.०५ सार्थकता स्तरावर प्राप्त 'r' मूल्य .६४४ हे नमुना 'r' मूल्यापेक्षा (.२८५) अधिक आहे. म्हणून शून्य परिकल्पनेचा त्याग करावा लागेल. यावरून असे दिसून येते की, उच्चमाध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून यतो. उच्चमाध्यमिक स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात धनसहसंबंध असून तो वैध व विश्वसनीय आहे.

- **परिकल्पना क्र. ०४:** स्वाधीनता मात्रा (df) ४८ साठी ०.०५ सार्थकता स्तरावर प्राप्त 'r' मूल्य .५६९ हे नमुना 'r' मूल्यापेक्षा (.२८५) अधिक आहे. म्हणून शून्य परिकल्पनेचा त्याग करावा लागेल. यावरून असे दिसून येते की, महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात सार्थ सहसंबंध आढळून यतो. महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात धनसहसंबंध असून तो वैध व विश्वसनीय आहे.

चर्चा— प्रस्तुत संशोधनाचे वरील निष्कर्षातून लक्षात येते की, प्राथमिक, माध्यमिक, उच्चमाध्यमिक व महाविद्यालयीन स्तरावरील शिक्षकांचे समायोजन व व्यवसाय समाधान यात वैध व विश्वसनीय सहसंबंध आहे. म्हणजेच शिक्षकांचे समायोजन अनुकूल असेल तर त्यांचे व्यवसाय समाधान चांगल्या पद्धतीने होवू शकेल. समायोजनात आर्थिक, भावनिक, सामाजिक, मानसिक समायोजनाचे महत्त्व अधिक आहे. यासाठी शिक्षकांच्या या गरजांकडे लक्ष देणे अतिशय महत्त्वाचे आहे. ज्ञानदानाचे कार्य हे पवित्र मानले जाते. परंतु शिक्षकांचाही विचार करणे गरजेचे आहे. याकडे, मुख्याध्यापकाने, संस्थाचालकांनी, शासनाने लक्ष देवून यागोष्टीसाठी शिक्षकांना न्याय दिला पाहिजे.

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A Study on Impact of Employee Turnover on Hotel Industry

Ms. Bhawana Pant*

Abstract: *Hotel trade is labelled as a service sector that provides services to their guest. The business needs personnel to cope and supply to the guest demands. This case creates the business to be labour intensive. However concerning personnel provide to the industry? Over the years ratio has become a part of the industries challenge to retain and use new manpower. The analysis was to grasp the determinants of Job Satisfaction and Effects on ratio within the hotels. The main target was on the cordial reception business Food and food department Operational workers. The analysis tried to assess the determinants of Job satisfaction and their call to quit so making a scenario of Turnover. This has been results of vast efforts of the government and also the trade positive steps in boosting its attractiveness as a toured and cordial reception destination on the world. These unit varied International building chains already in Bharat that area unit increasing their area inventory at a quick pace to fulfil the longer term demands of accommodation and leisure services. However with each success there comes some reasonably issues or issues that area unit required to tackle as they may delay the organization or the trade as a full. The main problems that are a part of every growing trade in past is to row out itself from the matter of turnover rate. It's same that turnover is one silent a part of human resource management which may have a negative impact for the organization if managed inadequately. This paper is an endeavour to search out the explanations why building trade in India is facing this issue and what area unit the attainable effects of it on the trade which could slow or hold still the expansion of trade as forecasted.*

Keywords: *Business, industry, hotel, management, Employee turnover, Human resource practices and policies, Retention, Organisational performance trades, organization, etc.*

Introduction: Justine Vogt explained the importance of hospitality in his words as "Hospitality is making your guests feel like they're at home, even if you wish they were."^[1] now-a-days hotel industries are playing an important role in the hospitality. The business is doing nice consistent with completely different reports and statistics however there's pressing got to check out the varied drawbacks or issues continuous in building business one such is that the high turnover rate. Current scenario about hotel industry in our country remains bereft of enough trained men. This sector is facing severe challenges from alternative industries; psychological feature aspects like engaging wage compensation, maintaining a decent work life balance, higher opportunities to grow appears to be the most reason for the abnormal ratio. Ordinarily company faces higher rate once there square measure a lot of employment opportunities within the market by employers. The report given by Travel and Tourism council economic impact report 2015, "The Indian Tourism and Hospitality industry is one of the fastest growing and most important segments in the earning of revenue and as well as employment. The tourism and hospitality sector's direct contribution to GDP in 2016 is estimated to be US\$47 billion."^[2]

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Literature Review

The hotel represents one among the foremost dynamic and thriving industries, in addition as in countries everywhere the planet. Some countries have preserved an oversized commercial enterprise trade that supports activities that have formed the country's economy. Before discussing why turnover represents a major issue within the cordial reception trade, it's necessary to know the character of the trade, in addition because the doubtless vital role of human-resources policies and methods in reducing the turnover within the trade. Teng (2013) delineate the cordial reception trade as a corporation with a purpose to satisfy a full vary of wants like food, beverages, and accommodations. The cordial reception trade involves frequent guest–host interactions and cordial reception organizations that cater to the wants of a various cluster of individuals.

The hotel industry enterprise trade provides many roles round the globe and extensively contributes too several countries' gross domestic product (GDP) (Vasquez, 2014). Therefore, extra analysis could facilitate leaders in such industries improve employees' performance, enabling them to vie additional effectively within the cordial reception trade (Dobre, 2013; Dragoni, Park, Soltis, & Forte-Trammell, 2014; Verbos, Miller, & Goswami, 2014). as a result of the cordial reception trade is comprised of production and repair dimensions, the creation and delivery of services from the building to the client are hooked in to the staff (Faldetta, Fasone, & Provenzano, 2013). Thus, the success of this trade primarily depends on the accomplishment, management, and retention of staff. This makes the high turnover rate rates of the building trade problematic.

The seasonal nature of the hotel industry remains a major reason behind the high turnover rates (Faldetta et al., 2013). The finding of the analysis conducted by Faldetta et al., 2013 disclosed that building managers ordinarily rent and fireplace staff supported seasonal fluctuations, managers stay unaware of the labour-versus-demand concept; thus, building managers stay unprepared to synchronize labour to demand. Specific challenges from personalization/customization, service management, branding, and social media use would possibly influence turnover. A major want for trade leaders is to find out higher management techniques that will aid in retentive the foremost valuable, well-trained staff, effectively serving to the trade vie within the cordial reception market with ease (Brown, Thomas, & Bosselman, 2015). Faldetta et al., 2013 indicated that specially, high turnover may well be harmful and turbulent to the cordial reception trade (Faldetta et al., 2013). AlBattat et al., (2014) argue that compensation and accidental rewards have an effect on turnover rate within the cordial reception trade. Unacceptable operating conditions, poor coaching, and inadequate salaries may conjointly cause high turnover rate. Lee & Chao (2013); Mohsin, Lengler, & Aguzzoli (2015) conjointly argue that the consequences of job security, earnings, and structure loyalty on turnover correlate with each other. Mohsin et al. (2015) examined the quadratic and linear relationships between the intention to depart one's job and their antecedents on a sample of 884 cordial reception employees members in Asian country and located the consequences of organization enthusiasm and stimulating job experiences on turnover rate to be quadratic. Management was for the most part liable for keeping employees from feat.

Pohler and Schmidt (2015) conjointly examined the connection between monetary incentives and turnover rate. They evaluated the consequences of social control pay-for-performance on the turnover of staff in non-management positions, victimization the agency and equity theory and finished that social control pay-for-performance policies

would possibly negatively have an effect on the connection between staff and management, resulting in a high employee-turnover rate. The findings from analysis conducted by Pohler and Schmidt supported previous literature assertions that pay may have an effect on worker outcomes like job satisfaction. Apart from pay, institutional factors like opportunities for advancement and promotions, the existence of work-group cohesion, effective and corroboratory leadership, and satisfactory compensation may influence turnover (Qiu, Haobin Ye, Hung, & York, 2015).

Aims and objectives

- a. To find out the effect of salary on the quality of the work in hotel industries.
- b. To analyse the differences of salary in different hotels.
- c. To compare the qualities hospitalities in various hotel.

Hypothesis

- a. The impact of salary in found on the hospitality in hotel industries.
- b. Hotel to hotel salary varies fir the same work and same time period.

Method of the Study: Current study is based on finding out the serving quality of hotels and the effect of salary on the quality of the hospitality. Though, this is the case study, the researcher tried to get information indirectly. The approach of researcher in the hotel was as a customer. Hence, it's totally survey based, but researcher took care of not mentioning name of any hotel here in the case study. Secret is kept for the prestige and market issue of the hotels.

Source of the Study: The researcher has used two types of data i.e. primary and secondary data collection.

- a. The primary data were collected through oral discussion with hotel manager and other employees showing as a casual discussion.
- b. The secondary data were obtained from journals, textbooks and internet and other supporting printed material.

Challenges Faced By Hotel Industries

The business is facing a big attrition challenge of concerning 40-50 p.c. Most of the building teams typically have regular coaching programs and learning and development initiatives throughout the year that impart numerous useful skills into the worker. Currently these candidates with imparted skills square measure in demand for service orientated sectors like banking, retail, facility coming up with and airlines, among others. It won't be incorrect to mention that a talent war is being fought among the business as they're losing consummate professionals thanks to the supply of higher career opportunities for the worker or candidates. associate worker functioning at lower level is usually seen dynamic the organization in an exceedingly span of half dozen months that proves as a loss for the organization as during this short time the coaching and development prices pay on him/her aren't coated.

Current work focuses on the topic to seek out the impacts of such high ratio magnitude relation in Indian welcome business and aims at sorting out the best attainable ways that and suggestion to beat and strengthen the business with stable hands and multiplied productivity. Though the hotel industry has been functioning for centuries, various hotelier quotes exist that can help to explain how the industry has changed over the many years.

The incidence of high turnover rates within the building trade has been the topic of substantial range of studies. Abundant of the analysis has been centred on characteristic the causes of turnover and formulating ways. Though there is Very little attention, it has been

given to spot the particular result of turnover on the performance of the organisation and conjointly the effectiveness of human resource practices and policies in holding staff. This study tries to handle the deficiency of analysis during this space by exploring the result of ratio on completely different aspects of performance of the organisation and conjointly by reviewing, however effective is that the worker retention ways followed within the hotel? The effect if salary may be found on the work quality of employees. Employees' satisfaction is very important in any industrial sector, but more important in hotel industries. The reason behind it is hotel industry is for hospitality, if one severs properly to customers coming in the hotel, the turnover may be increases of the hotel. It has another negative impact if employees are not having proper salary, their devotion towards work will be less. As defined the term serving by M.K. Ghandiji, "The best way to find yourself is to lose yourself in the service of others."^[3]

Hotel Industry in Global Era

In current era, the hospitality business is experiencing high labour turnover globally. Changing demographics and social norms are moving the labour pool. Loyalty to one leader isn't any longer the establishment (Gustafson, 2002). Recruiting the correct individuals, coaching them properly and treating them well in their work might not sound like rocket science. Just about any edifice will recruit gifted and extremely intended staff. But it appears that they need issue in retentive them. High business turnover rates, increasing prices and therefore the tight labour market build turnover the most important hindrance to the cordial reception business (Gustafson, 2002).

Employee turnover is rising sharply. Labour turnover for the cordial reception business rose to fifty three and around 04% in 2000 up from twenty seventh in 1994 (Hotel and job coaching Company, 1994). The employees' turnover figures of many hundred once years don't seem to be uncommon for the cordial reception business. Just like the turnover figures, the price of turnover is additionally high. Each incident of turnover and replacement involves time, cash and even potential loss of business. Labour turnover is problematic within the hostel business that has already got achievement difficulties. In 2008 the figures has gone up to eightieth, compared to seventy eight in 2006 (CIPD Annual Survey Report, 2008).

Effect of Turnover on Organisational Performance:

The literature reviewed shows that everyone the organisational performance is negatively littered with turnover. Even if, the case study discovered that not each performance is littered with the worker turnover. The result of turnover depends on the one who leaves. For instance, once a poor performing artist leaves it sensible for the organisation and good for the employees ethical on the opposite hand once an honest member of employees leaves it's a negative result on the organisation. One more finding was that the result of turnover is expounded to rate of turnover. If the speed of turnover is incredibly less there's hardly any result however because the turnover goes up there's a negative result on the organisation.

The main reasons given by folks that argue turnover incorporates a negative result is, the longer the employees stays they get to grasp the purchasers and their expectations and are able to deliver the specified standards. And once a replacement member of employees comes in instead they have a tendency to form mistakes within the coaching amount and therefore the mistakes value in some ways that. Brien, (2004), Hinkin and Tracey, (2000) and Payne, (1997) shares the same read. There is conjointly another indisputable fact that

having new employees within the team brings new life and enthusiasm to the whole team. The result of the case study doesn't prove that having long serving employees makes the business any higher. What makes the business higher is coaching, caring and doing what you are doing, doing it higher than anybody else.

Financial performance of the organisation is littered with turnover due to the completely different costs (cost of hiring, value of coaching and price on selling) concerned in it. All though, the number of the respondents noted that since every new person used will return on the earnings if associate degree organisation will flip over the staff in each half dozen months it'll keep the employees' wages lower. Productivity is affected slightly by turnover however cross coaching of employees in several sections of the department and an honest coaching system can facilitate in reducing the result of turnover. Whether or not the turnovers have an effect on the present employees completely or negatively extremely depends on the one who leaves the organisation.

On the opposite hand the results of the case study conjointly discovered that client retention; client satisfaction, service commonplaces and competitive performance of the organization won't be littered with turnover if the organization is ready to maintain the consistency and high standard of the merchandise and therefore the angle of the organization. This might be achieved by having correct coaching system and other people to hold out them, strict follow in employees allocation and recruiting individuals with client skills and are on top of average intelligence that the conclusion is drawn because the turnover has some avertible associate degree ineluctable result on the performance of an organisation. The result on money performance, existing employees and productivity will solely be reduced but the result of turnover on client retention, client satisfaction, service standards and competitive performance is avoided with the assistance of correct coaching system and other people to hold out them, strict follow in employees allocation and recruiting

Causes of Turnover

The key discussion within the literature highlights pays because the major reason for turnover. Poor qualities of supervising and poor operating conditions were conjointly quoted additional usually. The opposite major reasons of turnover mentioned within the literature are restricted chance for advancement, poor performance that will not meet the standards and expectations of the leader, the pre-employment expectations weren't met by the organisation, returning to high school or school, antisocial hour's conflict with the managers and stress and burnout.

The views of staff on the explanations they'd leave this organisation shows similarity to the most important reasons of turnover known from literature review. Ninety six of the respondents' aforesaid higher career opportunities and money edges can be a legitimate reason to maneuverer to a different organisation followed by forty eighth of the respondents felt that stress and poor operating setting will act as a reason for turnover. but the proof from interviews conducted imply the most important reason for the turnover within the case study organisation is due to recruiting long run tourists and students followed by the placement of the organisation.

According to the study conducted by edifice and job coaching company (1994) the most (70% of respondents) reason given for departure was recluse hours and low pay. Even if this case study verifies the latter antisocial hours was one in every of the least sited reasons for departure the organisation. This might be due to the actual location of the organisation.

The Human Resource Practices and Policies and Their Effectiveness

The literature highlights that employers use a variety of measures to boost worker retention like coaching, career development, versatile work practices, in a similar way edges, money incentives, the operating setting, organisational identity and therefore the portfolio approach (Bell & Winters, 1993; urban centre & Forbringer, 1992; Hogan, 1992). in line with the CIPD survey (2008) the foremost of times cited actions taken by organisations to handle retention is increasing pay (53%) followed by increasing learning and development opportunities (46%) and rising choice techniques within the 1st place (46%). The human resource polices of the case study organisation offers importance to social relation between the worker and management and providing an honest operating setting instead of giving money edges. But the organisation conjointly provides the essential money edges that the other organisation provides. From the case study it can be finished that the policy of the organisation isn't to retain the employees however to keep up consistency and high commonplace of service. Hence the human resource practices and policies of the organisation are aimed to supply an honest operating setting to not stop them from departure the organisation. This can be supported the argument that the employees can advance after they are able to advance or if they're not happy. And if the organisation incorporates a bunch of individuals' agency keep because of as a result these edges then as times travel as a result of people obtaining lighter, or board the standards slowly begin to say no.

Evidences from the case study recommend that the human resource practices and policies of the case study organization are effective in retentive the workers. All the mangers of the organization have over three years of service and fifty six of operational employees have over a pair of year of service. Ninety six of the operational level employees of the organisation are happy with the duty. Eightieth of the operational employees agrees the pay and edges given within the organisation are sensible. Nearby 79.17% of the employees aforesaid their expectations were met. This truly shows that the human resource practices and polices followed within the organisation are literally effective in retentive staff. Thus it can be summed up from the case study that, if the organisation concentrates on recruiting quality labour which matches in conjunction with the remainder of the team and supply an honest operating setting the organisation are mechanically in a position to retain the workers.

Conclusion

The overall aim of this analysis was to review the effectiveness of human resource practices and policies in retentive the workers and to analysis the effect of turnover on organisational performance. the most conclusion which will be drawn is that the particular reason for turnover differs from organisation to organisation and is directly associated with the characteristics of the organisation further because the practices and procedures of the organisation. Thus, once addressing the difficulty of turnover instead of giving edges and pay raise the small and macro setting of the organisation needs to be thought of 1st. It's obvious from the discussion allotted on top of that some result of turnover on the performance of an organisation is reduced and a few others is avoided. The result on money performance, existing employees and productivity will solely be reduced, however the result of turnover on client retention, client satisfaction, service standards and competitive performance is avoided with the assistance of correct coaching system and other people to hold out them, strict follow in employees allocation and recruiting. It's

conjointly evident that organisations got to concentrate chiefly on the merchandise to keep up consistency and high standards instead of making an attempt to keep up the one who delivers it to achieve that correct coaching and an honest operating setting needs to be provided.

The results of the case study conjointly discovered, that staff is maintained by recruiting quality labour, which matches in conjunction with the remainder of the team and by give an honest operating setting. The human resource policies and practices supported social relation between the worker and management, that are aimed to supply an honest operating setting instead of giving money edges tried to be effective in retentive the work.

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Performance of Risk and Return on Selected Mutual Funds- A study

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Abstract

A mutual fund is a pure intercessor, which performs basic function of buying and selling security happening behalf of its investors or unit holders. A proper evaluation measure will remove confusion and help small investors to choose about level of investment in many mutual fund schemes ,so as to maximize the returns. Indian capital market provides various investors help them to invest various industry., securities, and commodities and to ensure the profitable return. Mutual Funds help the small and medium size investors to participate in the today's complex and current financial scenario. Investors can participate in Mutual funds to buying the units of a detailed Scheme. In this paper we have taken selected schemes were assessed on the basis of Sharpe, Treynor and Jensen's measures.

Keywords: Mutual funds, Net Asset Value, Standard Deviation, Sharpe, Treynor and Jensen's Ratio

I. Introduction

In Mutual fund industry has developed by leaps and boundaries, A proper evaluation measure will remove misunderstanding and help small investors to decide approximate level of investment in various mutual fund schemes, so as to minimize the risk maximize the returns. Further the growing rivalry in the market forces the fund managers to work hard to satisfy investor and the management. A regular performance assessment of the mutual funds is essential for the investors and the fund manager a soon the basis of their turns associated with the risk free security and stock market directories. The primary capital market was very in active and reclusive. The unorganized and private player's theaters vital role for maintaining the liquidity in the country. In short the chaotic environments raised in the economic system of the country. Some serious attention was drawn towards the financial system in India at the time of preparation phase. Most of the economist recommended for the adoption of the mixed economy proposal. The planner of Indian economy stabs to adopt the balanced economy, which has beneficial for socio economic and political areas. The prevailing government was started establishing various financial institutions for fulfilling the obligation for industries and agricultures; it also started state-owned financial institution for providing the finance without any interruption. UTI is one of the largest and oldest mutual funds in the country. Later on the other private sector companies and financial institutions adopted this mechanism and started to mobilize fund through the concept of mutual fund. India economy stood among the fastest growing economy in the world. The huge potential market is also unlocked for the mutual fund industry; this would accelerate the growth of the industry. Generally Indian economy called as a redeemable economy,80% of population has saved more than 35% of GDP rate. The present saving shell channelized in the mutual fund industry as it proposals a variety

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of investment avenues. In India there is a huge scope for mutual fund area in tire I and Tire II cities. Further scope is open from agriculture sector and other allied sectors for mutual fund players from the rural areas. It is forecast that mutual fund sector would grow at a rate of 30% to 35% in resulting five years, and it will reach 300 Billion USD by 2015. As it can be noticeable, there is huge and potential growth in the mutual fund area. The mutual fund industry is very sound and growth oriented in the next future based on the continuous developmental actions in this sector

II. Literature Review

(GUPTA, 2013) Mutual fund industry has experienced a radical growth in the past two decades. Increase in years notes the importance of Indian mutual funds industry. To fulfill the expectations of millions of retail investors, the mutual funds are mandatory to function as successful institutional investors. Proper assessment of various fund performance and their contrast with other funds helps retail investors for making investment decisions. Considering the interest of retail investors modest statistical techniques like averages and rate of returns are used.

(Dr.Sarika,nov2015)However, there are differences between the two. Saving refers to funds kept for making specific purchases the number of schemes with increased mobilization of funds in the preceding few in the comparatively nearby future and for emergencies. Investing, on the other hand, focuses on increasing net worth and realizing long-term financial aims. Investing involves risk of loss of principal and is more concerned on their turn of investment. This total risk, calculated by standard deviation, can be divided into two parts Unsystematic risk, systematic risk. Unsystematic risk is also termed diversifiable risk. Systematic risk may be called non-diversifiable risk, unavoidable risk or market risk and measured by Beta.

(Jain, jul 2012) The study has investigated the performance of equity founded mutual fund schemes in India, using CAPM. In the long run, the private and public companies have achieved well. While reliance and kotak mutual fund trades have been the best performers than the UTI and SBI has worst performer. The result clearly designate that over the period of last 15 years, the private sector mutual fund companies have outdone then the public sectors and by observing the performance of each and every mutual fund.

(Ravikumar, Aug 2013) In their paper evaluated the performance of selected Indian mutual fund schemes in terms of five performance measures (a) Sharpe ratio (b) Treynor ratio (c) Jensen measure (d) Sharpe differential return measure (e) Fama's mechanisms of investment performance using attuned monthly NAV of 60 schemes from 10 mutual funds for the five year dated, that is, from April 2000 to March 2005. Two Benchmark Portfolios (a) Market Index (b) Set of Fundexes was used for this purpose. Monthly antiquated on 91-days Treasury Bills was used as a surrogate for risk free rate of return.

(Bansal, may 2012) However, there are variations between the two. Saving refers to funds kept for making specific purchases in the fairly near future and for crises. Investing, on the other hand, focuses on financial increasing net value and achieving long-term goals. Investing involves risk of loss of principal and is more anxious on the return of investment. This total risk, measured by standard deviation, can be divided into two parts Unsystematic risk, methodical risk. Unsystematic risk is also called diversifiable risk. Systematic risk may be called non diversifiable risk, inevitable risk or market risk and measured by Beta.

III. Objectives

The objectives of this study is,

- To study and analysis the five year annual growth return given in their schemes.
- To help the investors, where choosing the top mutual fund affording to their risk among selected schemes factors.
- To measure the risk return relationship of selected sector fund schemes
- To classifies return and compare the schemes of growth return.

IV. Research Methodology

This research paper is analyzed and data collected from secondary data. And this research paper is a descriptive research design has applied.

A. Secondary sources

In this research paper data were collected from various edited books, conceptual paper, newspaper, magazines, journal, published reports of mutual funds.

Financial tools for analysis:

Mutual funds schemes identifying the performance of mutual funds were calculating with the help of these models.

- Sharpe model
- Treynor model
- Jensen model

B. Data analysis

The study based risk and return on mutual funds schemes. It has been considered and determined top 5 schemes as its UTI transportation and logistics fund, SBI pharma fund, Birla sun life MNC fund, Reliance pharma fund, ICICI prudential banking and financial service fund. For this calculation of the risk is used the daily growth of net asset value (NAV) of the mutual funds along with closing price.

1) Alpha:

It's basically is difference between there turns an investors expected from a fund A positive alpha means the fund has out performed its benchmark index and negative alpha indicates underperformance of the fund.

2) Beta:

Measure the volatility of a particular fund in comparison to the market as that is the extent to which the fund's return is impacted factors. Beta is calculated using a statistical tool called regression analysis.

3) Standard deviation:

The total risk is that how much the risk of there turn on a fund is deviating the expected return based on performance of the funds. And it indicates that the net asset value (NAV) of the mutual fund more volatile than risk than a fund with lower standard deviation.

4) Sharpe ratio:

SR is an important measure that evaluates there turn that a fund the generate relative to the risk taken Risk is measured by standard deviation. It is used for the fund that has low correlation with th ebenchmark. It indicates that risk-free asset would perform better than the fund being analyzed.

5) R-Squared:

Measures the relationship between a portfolio and benchmark and its thought percentage from 1 to 100 not measured the performance of the portfolio

Name of the scheme	Last 5 year return	Standard deviation	Beta(risk)	Alpha
UTI transportation and logistics fund	29.14	22.82	1.16	19.63
SBI pharma fund	26.68	14.34	0.88	5.56
Birla sunlife fund	25.01	17.58	0.73	11.86
Relaince pharma fund	23.16	23.16	0.88	7.31
ICICI prudential banking and financial service fund	20.66	20.66	0.85	3.05

Here we analysis the last5 year return on mutual fund.And calculate the net asset value NAV and standard deviation from the return. Beta value analyzed for the UTI transportation and logistics fund(1.16), SBI pharma fund(0.88), Birla sun life fund(0.73), reliance pharma fund(088), And ICICI prudential banking and financial service fund(0.85) of top 5schemes.

Name of the scheme	sharpe ratio	R-squared (%)	Rank
UTI transportation and logistics fund	1.55	61	I
SBI pharma fund	1.37	85	III
Birla sunlife fund	1.41	53	II
Reliance pharma fund	1.01	95	IV
ICICI prudential banking and financial service fund	1.23	90	V

Analyzed the sharpe ratio form the beta value as it's the schemes the ratio were find from the CAPM. Then calculate R-Squared value of scheme of mutual funds. And then rank the schemes.

C. Findings of the Study

The present study respond that, in most of the cases mean return on equity mutual fund scheme more than the risk return on other mutual fund schemes and SBI, ICICI, Birla sun life , reliance, UTI term deposit rates. Further equity mutual fund schemes show that remarkable return for the period of 1st year and 5th year. Mutual fund provide both income and capital appreciation while avoiding excessive risk.The mean return on hybrid mutual fund schemes has shown instability during the study period, and served the purpose of hybrid funds only during the period of 6months,1styear and 5thyear. The mean return on debt mutual fund schemes top 5 selected schemes was consistently positive from the 5 schemes.

- 70-100% is the good correlation between the returns
- 40-70% is the average correlation between the returns
- 1-40% is the low correlation between the returns

The performance of risk based mutual fund schemes using CAPM. In the long run, the private and public sector companies have performed far better than the public sector. Monthly NAV of different schemes have been used to calculate the returns from the fund schemes. BSE Sensex has been used for market portfolio. The historical performance of the selected schemes were evaluated on the basis of sharpe , treynor ,and Jensen's measure

whose results will be useful for investors for taking better investment decisions. From Treynor results, it found that 19 out of 29 schemes had outperformed the benchmark. There taken sharper at and then R-Squared value shows the positive Alpha value and indicates performance the schemes

V. Conclusion

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A Study Of Induction Motor Protection System

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Dr. Arpita Yadav***

Abstract

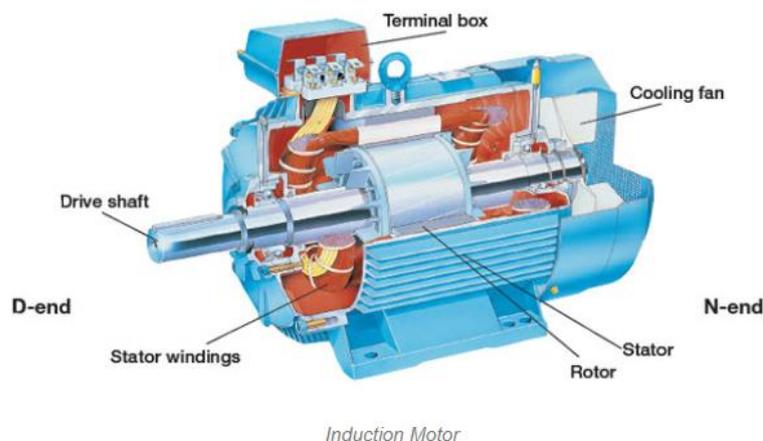
In the current era of automation, an induction motor is the most significant drive as this motor is applicable in a number of industrial applications. A protection mechanism is needed in order to protect these motors from all kinds of faults either electrical or mechanical. There are a lot of electrical faults which can be occurred in an induction motor. Some of these faults are high voltage, lower voltage, earth fault and overload etc. It is observed that the lives of these motors tend to shorten due to electrical faults as these motors get heated. The reason for the fault in an induction motor can be due to fault in the driven plant due to higher supply of power externally. The current paper highlights the mechanism for the protection of an induction motor.

Keywords: Induction Motor, Fault, Power

Introduction

An induction motor is also known as asynchronous motor which can be used for many applications. The speed of these motors is lesser than that of synchronous speed where the synchronous speed is considered as the magnetic field speed which is used to rotate the stator.

According to the sorts of supply of input, there are basically two types of induction motor i.e. single phase and three phase induction motors. Wound type and slip ring motor are the further classification of three phase induction motor.



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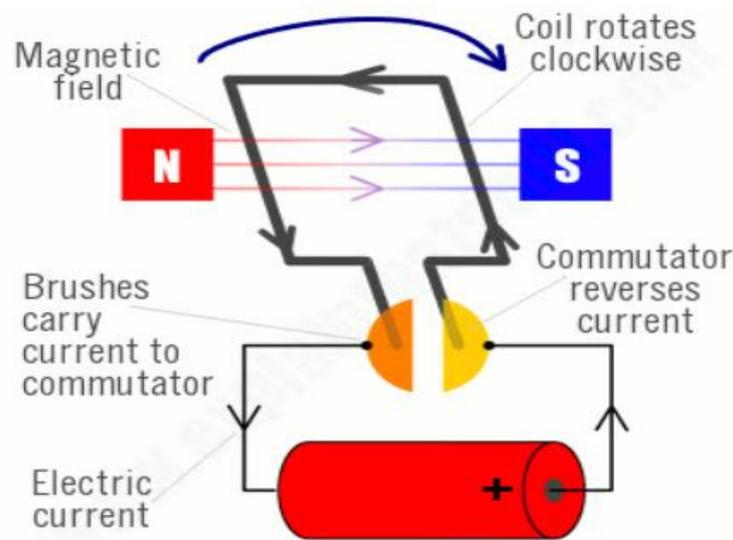
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Supply is essential in DC motor in order to aid the rotor and stator winding. But, in case of induction motor, only AC supply is provided related with the stator winding. As a result of AC supply, a flux is adjusted in the stator winding.

A rotating magnetic field is formed when this flux is allowed to rotate with normal speed i.e. synchronous speed. Due to alternative speeds in conductors and magnetic field, an induced magnetic field is generated. Short circuits are found in rotor conductors as mentioned in the Faraday's law.

This induction in electronic magnetic field thus leads to the generation of rotor current. Hence, these motors are known as induction motors.



Induction Motor Working Principle

An alternating flux also tends to generate around the rotor as the induction of current takes place in the rotor.

Induction Motor Protection System

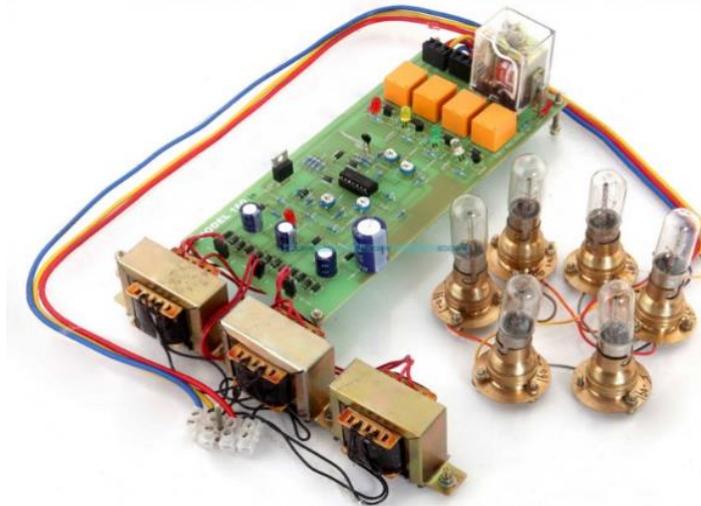
Induction motor is used in many industries. The load and the standard temperature are kept at normal conditions and three phase supply is used for these motors. A fault can be seen in an induction motor due to loss of any phase or increase in the winding's temperature.

The proposed protection system for the induction motor offers the process for the elimination of power supply to the motor suddenly if any fault is observed in any phase or the motor gets over heated.

In the proposed system, there are three phase power supply. In these phases, there are three transformers of single phase which are attached to it. A group of working amplifiers is also used for the purpose of input voltage.

The temperature of induction motor is measured with the help of a thermistor while keeping alongside of the body of the motor. The main relay is switched to operate the motor and single phasing is detected with the help of a group of relays.

Also, current sensors and phase sensors can be used here in order to protect the induction motor from overloading and wrong phase sequence. Due to the usage of the protection system for the induction motor, the life cycle of these motors enhances as the faults arising due to voltage and heating are avoided and the performance of the motor also improves effectively.



Protection System for Induction Motor

The problem in the supply system is the major cause of occurrence of faults in induction motors. These faults can be avoided by running the motor at specific voltage, load and current.

The supply voltage is also responsible for the proper working of an induction motor provided with a specific range and load should come under the stated limit so that the performance of the induction motors can be improved. When one phase out of three phase supply is open then single phasing is occurred. This kind of phasing is observed due to imbalance in the voltage. If single phasing is observed in three-phase induction motor then it tends to deliver the load with full efficiency.

The load is continuously driven by the motor until the motor gets heated or motor gets turn off due to some internal or external disturbances. In some cases, ground fault is regarded as the basic reason for the fault in the induction motors. Insulation conditions are raised due to unbalancing of phase current. This insulation failure is also responsible in some cases for the occurrence of fault in the induction motors.

In some cases, overload condition is occurred due to increase in the mechanical torque. Increase in phase current and overheating are some general issues causing overloading in the induction motors which are needed to be avoided. On minimizing the voltage, under voltage fault is occurred in induction motors. On the other hand, higher limit of voltage results into over-voltage in induction motors. Hence, the efficiency of the voltage should be moderated so that no fault can be occurred in the motor as any fault may degrade the performance of the motor.

Discussion

Over-current protection is the basic type of protection used against overloads and short circuits in stator windings of motors. Inverse time and instantaneous phase and ground overcurrent relays can be employed for motors above 1200 W. For small/medium size motors where cost of CT's and protective relays is not economically justified, thermal relays and HRC fuses are employed, thermal relays used for overload protection and HRC fuses for short-circuit protection.

Transformers are provided with over-current protection against faults, only, when the cost of differential relaying cannot be justified. However, over-current relays are provided in addition to differential relays to take care of through faults. Temperature indicators and

alarms are always provided for large transformers. Small transformers below 500 kVA installed in distribution system are generally protected by drop-out fuses, as the cost of relays plus circuit-breakers is not generally justified Line Protection.

The temperature of a motor winding is measured or monitored by measuring the resistance of the winding. This is done by introducing a small direct current component into the motor current, which can be done by connecting an asymmetric resistance device in the motor circuit. The resistance of the motor winding can then be determined from measurements of the direct current component and the corresponding voltage. This can also be done by using a magnetic amplifier with a bias winding excited in response to the voltage of the asymmetric resistance and a control winding excited by the motor current.

Thermal relay - the most common type of motor protection. The principle of its operation is based on the possibility of an electric current to heat a conductor through which it flows. The main part of the thermal relay is a bimetallic plate. Which, when heated, curves and thus breaks the contact. Heating plate occurs when the current exceeds its permissible value.

Fuses are the simplest and most common protection device. The purpose of the fuses is to disconnect the consumer (part of the lighting system, engine, etc.) from the mains with an unacceptably high overload or short circuit. At the same time, a large amount of heat melts the fusible insert of the fuse and thus breaks the electrical circuit. Being the most common protective devices, fuses at the same time are very imperfect. Fuses have a relatively small limiting breaking capacity.

Phase reversal problem occurs in motor when the supply phase is reversed due to wrong connection (except than ryb) due to phase reversal motor starts running in anticlockwise (opposite direction from normal) would cause operation and safety problem. Most of three phases motor run opposite phases. This type of protection is used in application like elevators where it would be damaging or dangerous for the motor to run in reverse. Generally when motor is connected with the important application then type of protection being much more important .when the load is connected with motor then reversal of phase means direction of rotation is changed. It could cause serious problem therefore much more care is required to protect the motor form such type of fault.

Conclusion

The induction motor have now become very popular as compared to other motor for many of the industries because it is low cost simple and extremely rugged construction, high reliability high efficiency and good power factor, low maintenance cost.

Induction motors are utilized as a part of different industry, for example, paper process, sugar industry, for driving the mechanical frameworks. The maintenance of an induction motor is very essential. The observing of induction motor through wired correspondence is costly as well as the information correspondence may influence because of physical conditions like human hazards. Hence wireless communication becomes price worthy turns on excellent substitute for observing as well as the control of induction motor. It upgrades the execution of the motor.

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Drought Mitigation

Liladhar*

Abstract

The containment and mitigation of the crippling impact of drought, and the eventual attainment of the objective of drought proofing of an area is contingent upon a proactive and relentless, but planned pursuit of a combination of structural / physical and non-structural long and short term measures. The short term measures are mostly reactive or relief centric in nature and mostly relate to in-season drought management through contingency planning and relief distribution. Long term mitigation measures are geared towards the adaptation to climate change, restoration of ecological balance through adoption of sustainable agronomic and conservation practices, sensible crop choices etc. Most of these measures are translated on the ground through soil and water conservation, watershed management, agronomic practices suited to rainfed agriculture and forestry programmes that seek to integrate soil, water and forestry management in an ecological compliant and sustainable manner.

Keywords: mitigation, drought, management, relief, change, season.

Introduction

Drought mitigation needs to be ensconced in the regular development programmes of the Centre and State Governments. Some of the most significant current national programmes that may have a decisive bearing on drought mitigation are Pradhan Mantri Krishi Sinchayee Yojna, National Rainfed Area Development Programme, National Rural Drinking Water Programme etc. Many of these programmes can be guided towards the development of a cogent drought mitigation strategy at the State level by taking advantage of the flexibility which has been in-built into the centrally sponsored schemes for the purposes of mitigation of calamities like drought.

Current Drought Mitigation Programmes

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been formulated with the vision of extending the coverage of irrigation 'Har Khet ko pani' and improving water use efficiency 'More crop per drop' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities. The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was approved by the Central Government in 2015-16. PMKSY has been formulated as an umbrella scheme amalgamating ongoing schemes viz. Accelerated Irrigation Benefits Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD&GR), Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR) and the On Farm Water Management (OFWM) of Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW). The Ministry-wise activities are presented in Table 1. The major objective of PMKSY is to achieve convergence of investments in major and medium irrigation projects with command area development to provide assured irrigation, improve

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on-farm water use efficiency to reduce wastage of water, enhance the adoption of precision-irrigation and other water saving technologies (More crop per drop), scientific and sustainable development of watersheds, enhance recharge of aquifers and introduce sustainable water conservation practices and attract greater private investment in precision irrigation system. District Irrigation Plans (DIPs) shall be the cornerstone for planning and implementation of PMKSY. DIPs will identify the gaps in irrigation infrastructure after taking into consideration the District Agriculture Plans (DAPs) already prepared for Rashtriya Krishi Vikas Yojana (RKVY) vis-à-vis irrigation infrastructure currently available and resources that would be added during XII Plan from other ongoing schemes (both State and Central), like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Rashtriya Krishi Vikas Yojana (RKVY), Rural Infrastructure Development Fund (RIDF), Member of Parliament Local Area Development (MPLAD) Scheme, Member of Legislative Assembly Local Area Development (MLALAD) Scheme, Local body funds etc. The gaps identified under Strategic Research & Extension Plan (SREGP) will be made use in preparation of DIP. DIPs will present holistic irrigation development perspective of the district outlining medium to long term development plans integrating three components viz. water sources, distribution network and water use applications incorporating all usage of water like drinking & domestic use, irrigation and industry. Preparation of DIP will be taken up as joint exercise of all participating departments. DIP will form the compendium of all existing and proposed water resource network system in the district. The DIPs may be prepared at two levels, the block and the district. Keeping in view the convenience of map preparation and data collection, the work would be primarily done at block level. Block wise irrigation plan is to be prepared depending on the available and potential water resources and water requirement for agriculture sector prioritising the activities based on socio-economic and location specific requirement. In case planning is made based on basin/sub basin level, the comprehensive irrigation plan may cover more than one district. The activities identified in the basin/sub-basin plan can be further segregated into district/block level action plans. Use of satellite imagery, topo sheets and available database may be appropriately utilised for developing irrigation plans at least on pilot basis to begin with and subsequently may be extended to all projects. State Level Sanctioning Committee (SLSC) chaired by the Chief Secretary of the respective States are authorized to sanction projects, oversee its implementation and monitoring. National Executive Committee (NEC) under the Chairmanship of Vice Chairman, NITI Aayog will oversee programme implementation, allocation of resources, inter-ministerial coordination, monitoring & performance assessment, addressing administrative issues. At National level, programme is to be supervised and monitored by an Inter-Ministerial National Steering Committee (NSC) under the Chairmanship of Hon'ble Prime Minister with Union Ministers of concerned Ministries as a Member.

National Rainfed Area Programme

The objective of the programme is to increase agricultural productivity in rainfed areas in a sustainable manner by adopting appropriate farming system based approaches, minimize adverse impact of possible crop failure due to drought and other calamities through diversified and composite farming system etc.

The National Rainfed Area Authority (NRAA) in the Department of Agriculture, Cooperation & Farmers Welfare an advisory body for policy and programme formulation and monitoring of schemes / programmes related to degraded land development for

horticulture and integrated agricultural development in rainfed areas. The Central Government approved the involvement of NRAA for providing technical inputs in policy planning, implementation and monitoring of PMKSY especially in the areas of rain water conservation / watershed development and its management including other agricultural and allied sectors.

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

Considering the importance of water conservation, and given all the scientific and technological advances at their command, the Ministry of Rural Development in consultation and agreement with the Ministry of Water Resources, River Development & Ganga Rejuvenation and the Ministry of Agriculture and Farmers Welfare has developed an actionable Framework to ensure that MGNREGS funds are used in accordance with the best practices in the sector. The need for drought proofing villages in water stressed blocks was being felt for many years. Many State Governments have started excellent initiatives for water conservation in last few years using Mahatma Gandhi NREGA funds viz. the 'Mukhyamantri Jal Swalalamban Abhiyan' in Rajasthan, the 'Dobha' or Farm Ponds construction in Jharkhand, the 'Mission Kakatiya' in Telangana. 'Neeru Chettu' in Andhra Pradesh, 'Kapil Dhara' in Madhya Pradesh, bore well recharge in Karnataka, 'Jalyukt Shivar' in Maharashtra are some of the recent initiatives. The present Framework draws on many of the good practices in these States and some other initiatives. The Framework strives to leverage the synergies between Mahatma Gandhi NREGA, Pradhan Mantri Krishi Sinchayee Yojana, IWMP and Command Area Development & Water Management programmes, given their common objectives. Types of common works undertaken under these programmes/ schemes are water conservation and management, water harvesting, soil and moisture conservation, groundwater recharge, flood protection, land development, Command Area Development & Water Management (CAD&WM). These programmes were addressing the above mentioned activities with their own set of planning tools, processes, technical expertise and financial resources which is now envisioned to be used in coordination to bring the advantages of each programmes/ schemes to strengthen a concerted action for water conservation and management.

The highlights of the Frameworks are:-

Paradigm shift from Relief Works approach to Integrated Natural Resource Management (INRM) approach in implementation of MGNREGS. *f*

Planned and systematic development of land and harnessing of rainwater following watershed principles to become the central focus of MGNREGS works. *f*

All lands falling under the watershed will be developed on ridge to valley treatment principle.

f Individual works (including work on private land) will be logically sequenced and packaged together on the principles of INRM, to form projects following the principles of watershed management in an integrated manner. *f*

Systematic identification, planning and implementation of projects leading to creation of sustainable and productive assets for the community.

District as synergizing unit for convergent planning under the leadership of the District Collector. *f*

With the convergence of the ongoing schemes in the area, a comprehensive project of village/ watershed/ command area, incorporating/ integrating all the works/ activities

required for the integrated development of the village/ watershed/ CAD approach is to be prepared.

Support of institutions like IITs, NIITs, Agricultural Universities, State technical institutions, professionals sourced as part of Corporate Social Responsibility and Universities as a part of the 'Unnat Bharat Abhiyan' to be promoted. *f*

The DPC to ensure that the Natural Resource Management component of Labour Budget of Mahatma Gandhi NREGS is essentially made part of the District Irrigation Plan (DIP). *f*

Technical inputs from the joint pool of IWMP in Watershed Cell cum Data Centre, Mahatma Gandhi NREGA unit, Water Resource Department, the Agriculture department, Regional Office of Central Water Commission (CWC).

Drought Mitigation measures

The objectives of these mitigation measures are to reduce soil erosion, augment soil moisture, restrict surface run-off of rainwater and improve the efficiency of water use. It involves a wide range of soil and water conservation measures and farm practices.

Water Harvesting and Conservation

Water harvesting and conservation refer to processes and structures of rainfall and run-off collection from large catchments area and channelling them for human consumption. In India, these processes and structures have been in existence since antiquity, but the increasing frequency and severity of droughts and population growth have focused on the revival of these practices and structures. Every household's minimum water requirements can be easily met by collecting rainwater locally from village / community ponds / large manmade containers, by diverting and storing water from local streams / springs and by tapping sub-surface water below river / stream beds. There are two methods for water conservation: (i) artificial recharge of groundwater, and (ii) traditional methods. While the artificial recharge of groundwater is used extensively in all the watershed development programmes being implemented, traditional methods of water collection and harvesting through ponds / tanks are even more important for assuring continuous and reliable access to water. Both methods include measures which are low-cost, community-oriented and environment-friendly. It is necessary for the Government and NGOs working in the area of water conservation to promote both sets of measures, depending on the local conditions. These methods are considered very useful for groundwater recharge both when rainfall is deficient and when there are flash floods (that result in overtopping of defined courses of rivers / streams and their spreading into flood plains). Harvesting and conservation of floodwater to rejuvenate depleted high-capacity aquifers by adopting integrated groundwater recharge techniques, such as dams, tanks, anicuts, percolation tanks, could improve water availability and create a water buffer for dealing with successive droughts.

Artificial Recharge of Ground Water

A typical watershed development programme has several components, depending on the topography (shape, configuration and slope of the land), nature and depth of soil cover, type of rocks and their pattern of formation and layout, water absorbing capacity of land, rainfall intensity and land use. These include the following:

Contour Bunding

Contour bunding is one of the most widely practised soil and water conservation measures, which controls erosion, conserves moisture, recharges groundwater and prevents silting of tanks and reservoirs in the downstream. The practice comprises constructing narrow-base bunds on contour to impound runoff water behind them, so that impounded water is

absorbed gradually into the soil profile. Contour bunding works are undertaken in shallow and medium soils. An area extending from the ridge-line (topmost line) to the valley-line (lowest line) is called a catchment. For a bunding project, a self-defended catchment (i.e. the topmost end of the catchment in the selected area is such that no water from outside the catchment drains into it) is selected. In the selected catchment, bunds are constructed on contours. The bunds are normally impounded upto a height of 30 cm. The spacing of the bund is decided based on the slope of the land and the nature of the soil. For gently sloping lands, with 2–3% slope, the bunds are nearly 200 feet apart. The section of a bund is also dependent on the value of the soil. In light soil, the section is 10 square feet, whereas in medium soil it is 24 square feet. About 25 mm of rainwater could be stored at a soil depth of 130–150 mm for growing crops. On average, contour bunds had 27% higher soil moisture and 14–180% higher yield than flat surfaces.

Contour Trenching

This consists of excavating shallow / intermittent trenches across the land slope and forming a small earthen bund on the downstream side. Plantation is done on the bund to stabilize the bund. The trenches retain the runoff and help in the establishment of plantations made on the bund. Trenches are useful where the land surface is fairly porous. Rainwater that gets collected in the trenches can quickly percolate into the ground. The spacing of trenches and their size (i.e. length, width and depth) should be adequate to intercept about 50% of the peak rainfall in semi-arid regions (annual rainfall of about 400–550 mm). The trenches should be cleaned and desilted periodically.

Contour Cultivation

Contour operations are done across the slope by cultivating crops and trees on the contour. The contour furrows created would form a multitude of mini barriers across the flow path of the runoff. Contour cultivation remains the most effective on moderate slopes of 2–7%. The water in the furrows gets collected in the depressions. Perennial grasses can be grown in such depressions. Another practice called strip cropping involves growing parallel rows of erosion-resistant crops to control loss of surface soil, with other crops grown in between.

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Workforce diversity: Issues and Challenges

Kajal*

Abstract

Globalisation and technology advancement are bringing people together across the globe. When people from different backgrounds and cultures work together, their similarities and differences need to be managed to maintain a positive work environment. Workforce diversity is becoming global strategic issue for big companies. No organisation can ignore the pervading influence of diversity on organisational growth. The aim of achieving competitive advantage encourages companies to embrace this concept of workforce diversity. Diversity can contribute to the success of organisations, if managed properly. Ceaseless advancement makes it crucial for every type of organisations to regularly improve their ways to manage diverse workforce. How effectively diversity is managed, depends largely on the perception and attitude of employees towards diversity supporting programmes and initiatives of organisations This paper is intended to study the issues a company faces to manage diverse workforce.

Keywords- strategic issue, diversity supporting programmes, different background and culture.

Introduction

The differences and similarities in terms of culture, religion, gender, age, sexual orientation, capabilities, psychological characteristics, race, etc among employees is called workforce diversity. It is the blend of workers from various ethnic background and national cultures. Diverse workforce perceive things differently and the way they interact with each other also differ. It encompasses differences in cognitive style, education, organisational function and working style. An organisational workforce becomes heterogeneous because of diversity.

Management of workforce diversity is vital to make divergent people cooperate and co-exist in the same organisation. The aim of recruiting and managing diverse workforce is to create supportive organisational climate, without any favouritism and discrimination. Successful organisations acknowledge the need to spend enough resources on managing the workforce diversity. An organisation's success largely depends upon its ability to embrace the workforce diversity. Diverse workforce with collection of skills and experience can come up with large pool of solutions to any problem. They can adapt with fluctuating market and customer demands easily. Multilingual employees from different background can prove to be great support, when a company thinks of expanding its operations geographically.

Workforce diversity has become a key issue in today's competitive world. Organisations are hiring employees with different psychology and mindset to use their talent for organisational growth. It is necessary for companies to hire diverse workforce to identify, attract and retain the best employees from different groups. Companies hire diverse workforce to get sustainable competitive advantage. This pool of talent makes it possible to

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understand the diversity of market. Most of the global companies are enjoying the benefits of practicing diversity by looking at skills irrespective of other differences. business have realised that increasing the workforce diversity improves performance and satisfaction of employees. Diverse workforce pays off in terms of customer satisfaction also. The diverse workforce often results in better and fast decision making, knowledge sharing and increased performance standards.

Why organisations need to recruit and manage a diverse workforce?

As global market is expanding, workforce diversity is becoming a business necessity to embrace difference to compete in the market. Any business can earn itself goodwill in market with diverse workforce, which will lead to more profit and employee satisfaction.

- **Better understanding of diverse market and customer** - different minds with different perspectives, experience and culture can make it possible to understand the mentality of different customer groups. Hindu employee knows better what kind of products hindu community needs, same goes with the employees from other religions. Employees from different geographical can give the best idea about market of their respective location.
- **Promotes innovation** - creative concepts born, when people with different experience, working style, background and qualification work together. One person may be good at generating innovative ideas, Other may have the ability and enough experience to execute the same in the best possible way. When people with different capabilities work together, they can overcome each other's weaknesses with their strength.
- **Improves performance** - report says that diverse companies are 35% more efficient than those who are not. Diversity brings in pool of talent and a wider range of skills, all of them work in one direction to meet competitive pressure with their unique skills. Encouraging diversity at workplace can motivate all employees to perform to their highest ability. They will come out of their comfort zone to match the level of others which will create a more productive environment.
- **Offers more exposure to employees** - employees learn from the different experiences and working styles of their co- workers who are different and better. Diversity opens the door of new technology and concepts for the employees. They come to know about different facts, crucial for their work, which they couldn't come to know, if worked with identical co-workers. Combination of various perspectives of diverse mind can come up with out of the box solution to any problem.
- **Employee Development** - workforce diversity not only vital for inside environment of organisation, but also equally important for outside reputation of business. With diverse workforce, business can manifests itself in building a great reputation outside, leading to increased employee satisfaction and productivity, which can bring new opportunities for employees. Workforce diversity brings opportunities to employees who have been marginalised because of racism, ageism, gender or any other reason.
- **Enhance organisational reputation** - workforce diversity boost the reputation in the market. Companies with diverse workforce are considered ethical and socially responsible organisations. Diversity makes the workplace lively and interesting. It will make easy for your customer to relate with you, when they get a bunch of employees to attend them in the way they like. And this is only possible when you have employees from different cultures and backgrounds.

Why manage diversity ?

Today companies are facing this prominent challenge of diverse workforce. More issues arise with the increase in workforce diversity.. Employers need to be aware of issues they need to address to manage workforce diversity.

- **Gender inequality** - studies say that 40% of people believe that managers prefer to recruit men over women. Another study reveals that there are 30% more chances for men to get promoted to a managerial position and they earn around 24% higher salary than women .Employers need to understand that this kind of gender discrimination can cost them loss of talented women employees.
- **Generation gaps** - employees from different generations can't easily get along with each other. Older generation employees often resist to adapt the changes in workplace and culture that younger generation are bringing in. Employees from different generations form groups and social circles with the employees of their own age. The seemented communication networks in organisation may isolate some employees from their respective work teams. Generation gaps can also result in lack of cooperation, coordination and disagreement among employees, because of differences in their working styles and thinking.
- **Cultural differences** - it is a huge challenge to overcome the deep rooted prejudices that employees have in their mind. These preconceived judgements against people of different ethnicity and religion, can lead an employee to make unfair assumption about his colleague. The stereotype generalization about a person increase tension and conflict at workplace. Employees often harass others on name on culture. There is a serious cultural gap between men and women also. Orthodox male employees feel that it is quite normal to harass female employees. This kind of cultural gap should not be tolerated with in organisation.
- **Lack of Mutual Respect and Acceptance** - employees can't collaborate and share their ideas with each other, if they don't accept the differences between them. Lack of acceptance and mutual respect can result in conflict and which at the end effectuate the situation of violence. Acceptance is necessary to foster mutual respect among employees at workplace. Employees can't work well without copacetic work environment. Mutual respect and teamwork increases productivity and reduces conflict among employees.
- **language and communication barriers** - communication barriers are always present in diverse organisation. It becomes difficult to embrace diversity in workforce when there are differences in language and communication. Employees with different mother tongue face problems in communication with the person with different first language. Language differences can lead to low productivity, miscommunication and lack of trust between employees. Company can prevent this problem by hiring bilingual or multilingual employees to bridge the gap between them because of language.
- **Mental and physical disabilities** - Resistance to change - every organisation have employees with rigid mentality, they refuse to accept colleagues with different cultural background, working style and language. It's hard to change long established corporate culture, this attitude of resistance to change silences the innovative ideas and growth of organisation."We have always done it this way" mentality of employees is a major roadblock for minorities to survive in corporate settings.

How to manage workforce diversity at workplace ?

Diversity can be a curse rather than a blessing, if not managed properly it could turn into a liability.. Recruiting diverse workforce is not enough, managing the same is equally important to reap the maximum out of it. Conscious efforts need to be taken to make heterogeneous groups coexist and work together.

Sensitivity training - It is a great way to make people self aware by getting other's views and perspective. It helps employees to know their offensive actions and reasons behind the behaviour of others. Sensitivity training give employees chance to calmly communicate with coworkers, accept their differences and clear their misunderstandings. This exercise can justify their actions and resolve their conflicts. Employees can find out the best way to coexist and achieve harmonious workplace environment by practicing sensitivity training.

Emphasize Communication - delivering frequent feedback and coaching to employees about their behaviour and performance can align them around common goals. Employer must keep constant communication with each and every employee who works for him. One thing may be polite in one culture may sound rude in another culture. To overcome these kind of language barriers it is vital to ensure that all the necessary communication channels are open for everyone. Mutual trust can only build with better communication. Employees should be motivated to work together to improve their understanding and clear their misconceptions.

Foster positive organisational culture - organisational culture is the great indicator of employee satisfaction. The biggest challenge for managers is to build a culture where diversity is leveraged to foster a culture of inclusion. Inclusive workforce respect and accept each others differences, they value people for their skills and competencies. All employees work together and make equal contribution to achieve their common goal in positive organisational culture. It also earns company a good reputation in the market and attract talented employees irrespective of their culture and education.

Zero Tolerance policy - Employees must know that their off color jokes about other's differences will not be tolerated at the workplace. Employees should be held accountable for their unethical acts. Employees must be encouraged to report management against this kind of behaviour. Formal policies and rules for grievance redressal must be established for the convenience of employees. Proper application of these policies and rules should be ensured, culprit employee must be punished strictly to set example in fnt of others.

Develop team Conflict resolution skills - Different working styles and habits generate successful work but on the other side they can give rise to conflict among employees. Proper conflict resolution programmes can help employees explore perspective and opinions of each employee. Manager should train his employees to solve their issues by themselves first, instead of going to management instantly. Employer should motivate his employees to work in diverse groups and deal with their problems with patient and positive attitude.

Encourage teamwork - diverse workforce brings diverse ideas, experience and expertise which can prove to be really helpful in personal as well as organisational growth. Employer should encourage discussions and group projects to develop team spirit among employees. Frequent interaction among employees should be encouraged to make them comfortable in each other's company.. According to a study by Google, employees excel in teamwork, when they feel their work will be beneficial for their customers, community and colleagues.

Diversity training - employees unknowingly behave insensitively towards others because they don't know much about the other person. And these type of unintentional behaviour leads to misunderstandings and don't let people to coordinate properly. A strong leader should provide diversity training to help employees to get aware about themselves and make them understand the differences. Diversity training helps employees to understand their own mistakes and areas where they need to improve.

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“Study of Succession Planning in the Organization”

Ms. Purswani Khushbu Jetho*

Abstract: *The current study aims to find out the exact scenario of succession planning in the organization. There are so many planning which makes out a very effective future leader. The paper explore the different development, planning, process which are basic for the knowledge for improvement of the existing quality of knowledge in the study in the light of the development of organization. Awareness about this developing a leader with succession planning and plotting will be very much useful. There are different type of steps required for succession planning like: knowing vision, improving skills, setting goals, principles are a set of underlying things about how to proceed all the steps and qualities and its relation to organization. All organizations can have more or less systematic, integrated and proactive approaches to deal with the styles. Accordingly, there are so many challenges which cannot simply be implemented on the basis of the process, management structures and systems. It may require the detailing of work, the definition of roles, the design of structures, the learning of new skills by students and the reorientation of organizational goals.*

There are many students which are unaware about effective qualities for the good leader hence the researcher feels to study on the awareness of succession planning in the organization.

Keywords: *Succession planning, goal, skills, development, Organization, Factors, vision, grooming, awareness etc.*

Introduction: There are so many different steps of succession planning required for good leader. There are many challenges one leader have to face because of new strategies, new patterns for the growth of organization. Current study aims to study on the awareness of different steps for succession planning and challenges in organization. For an instance, the developing a leadership style fits to give idea to improve relationship between employees and organization, which are two interrelated factors that are important.

Literature Review

There are several studies on succession planning in the organization. Few of them are highlighted as:

1. **Neetha Mary Avanes** in **A STUDY ON SUCCESSION PLANNING AND ITS IMPACT ON ORGANIZATIONAL PERFORMANCE IN THE IT SECTOR:** The present study aimed at measuring the practice of Succession Planning and its impact on Organizational Performance in IT companies based in Bangalore. This study falls under descriptive study mainly aimed at fact finding. The method adopted to collect data is questionnaire method. The study found that the mean percentage of Succession Planning and Organizational Performance in IT consultancy firms is found to be higher than that of IT Product/Research firms and the relationship between Succession Planning and Organizational Performance is found to be positive.

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2. Suruchi Pandey, Deepesh Sharma in Succession Planning Practices and Challenges: Study of Indian Organizations Succession planning is a key in the current scenario of tight talent markets and competitive times. Strengthening talent has a direct impact on bottom line results and contributes to organizational growth. Hence development at talent level is a must for overall organizational development. The present study focuses on current practices and approach of succession planning followed by the industry.

3. Osibanjo Omotayo Adewale*, Abiodun Joachim Abolaji and Obamiro John Kolade IN SUCCESSION PLANNING AND ORGANIZATIONAL SURVIVAL: EMPIRICAL STUDY ON NIGERIAN PRIVATE TERTIARY INSTITUTIONS has been trying to understand and explain variables such as Turnover Rate, Career Development and Supervisor' Supervision) are insignificantly correlated with organizational survival.

The main objectives for study of succession planning in the organization.

- a) To make a uniform and skillful system involving all the leadership steps and standards across the country in the country.
- b) To improve the basics & deep knowledge with quality procedures across the country in the country.
- c) To minimize the efforts and improving the skills for succession planning organization.
- d) To replace a lot of other patterns to reduce efforts of organization
- e) To detailing of most of the steps of good leader.
- f) To improve the effect of the leadership for the improvement of each and every area.
- g) To improve the competitiveness of the students.
- h) To ensure the availability of knowledge for the improvement
- i) To reduce the complications in the system and organization
- j) To decrease the unhealthy competition among the organization due to unawareness of succession planning in organization.
- k) To reducing the management problems to avoid further issues.
- l) To simplify the process of selection of the good leader for the organization.

Thus, there are many good and beneficial aims and objectives of study of succession planning in the organization.

Aims and Objectives of the Study

To explaining about study of succession planning in the organization.

- a. To study about the awareness of succession steps for the organization for the good leader.
- b. To study of skills, responsibility, knowledge of good leader for the growth and development

Hypothesis

- a. There is not clear picture of about study of succession planning in the organization. to all the sectors.
- b. Students, employees are not having proper knowledge of about the steps required for the leadership to fit succession challenges.

Methodology

Data was collected from several books and Internet. The list of the papers are mentioned in the references.

Results of the Study

There are a so many steps for the succession planning in the organization.

1.To know about the Vision of your company and growth plan

For the prediction of future goal on the basis of all the data or previous information which will include detailed budget broadcast and starter planning accordingly all the money plans where it is going and strategies making for the growth is comes under the succession planning for the organization.



Image 1.1 Vision of your company and growth plan

With existing skills creating a inventory planning.

First you should see what are the quality or skills which already exist and what is the gap between your personal plans and the exiting skills. This basic fundamental can be used further.



Image 1.2 With existing skills creating an inventory planning.

3. Ask people about their goal like where they like to be in future.

Interaction with employee face to face is the best way to ask them openly about their goal where they want to stay in company, what they want accordingly transparent succession planning will be possible. To evaluate potential of each person and About their succession potential we should inform to employees .Grooming employees of organization according to three skills sets like potential, skills, desired track. Staffs who's having skill sets should be offered retention program.

Findings

- 1) There are many cases in which organization themselves are confused about developing different steps in the succession planning for the organization challenges and norms of it. Therefore, employees knew only that these are basics needed.
- 2) What is exactly steps in succession planning very few of know.
- 3) As study of succession planning in the organization is very basic & deep concept, it will not take time to understand to the students, employees also in the point of view of its organization.
- 4) It is not simple and easy to understand the steps, responsibility but we can understand and apply to improve the growth.
- 5) Overall study shows that early stage of developing of leadership styles will be a part of creating complication in the mind of students.
- 6) There are negative approach and views of students, employees about leader and its role responsibility and qualities.
- 7) Lack of facilities is also one of the major reasons to make students unaware about study of succession planning in the organization..

Suggestions of the Study

It is essential to give training for improvement of study of succession planning in the organization.

Need of counseling and communicating to all level of fields about study of succession planning in the organization challenges and its benefits.

- i. It is necessary to inform the students, employees about the qualities and its effect is more advanced and innovative than normal terms.
- ii. It is essential to convey all the students, employees to make aware that there is no exemption from improving styles to anyone, so they should prepare themselves with positive attitude towards the use of it.

It needs to go time to understand the particle skills, responsibility, growth from the study of succession planning in the organization and its effects to students, employees.

Conclusion

There are several cases within which students, employee themselves are confused about study of succession planning in the organization and its skills, responsibility of it. Therefore, students knew solely that these are some of styles required. What's precisely some of important steps and its applications only a few of apprehend. It's not straightforward and simple to apply groom the succession planning so the idea of developing a leadership fit to challenges is very much necessary for the improvement. There is negative approach and views of scholars concerning qualities, skills which will defiantly be a disadvantage. Also lack of facilities is additionally one in every of the foremost reasons to form students unaware concerning of steps Therefore the detailed and simpler way of study of succession planning in the organization for a leaders is necessary

for positive approach of the students. So that it will get easier and fully acquired by the student which will help them overcome the phobia of the skills or study of succession planning in the organization.

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“Developing A Leadership Style To Fit 21st Century Challenges”

Ms. Purswani Khushbu Jetho*

Abstract: *The current study aims to find out the scenario about the developing a leadership style to fit 21st century challenges. There are so many Styles which makes out a very effective leader. The paper explore the different development which are basic for the knowledge for improvement of the existing quality of knowledge in the study in the light of the development of organization. Awareness about this developing a leadership style to fit 21st century challenges is very necessary. There are different type of styles required for leadership like: Authoritarian Democratic, laissez-faire or delegate. The principles are a set of underlying things about how to develop the styles, qualities and its relation to organization. All organizations can have more or less systematic, integrated and proactive approaches to deal with the styles. Accordingly, a 21st century there are so many challenges which cannot simply be implemented on the basis of the existing styles, management structures and systems. It may require the detailing of work, the definition of roles, the design of structures, the learning of new skills by students and the reorientation of organizational goals.*

There are many students which are unaware about effective qualities for the good leader hence the researcher feels to study on the awareness of developing a leadership style to fit 21st century challenges.

Keywords: *leader, styles, development, Organization, Factors, Authoritarian, Democratic, laissez-faire , awareness etc.*

Introduction: There are so many different types of leadership styles required for good leader. There are many challenges one leader have to face because of new strategies, new patterns for the growth of organization. Current study aims to study on the awareness of different leadership style to fit 21st century challenges. For an instance, the developing a leadership style to fit 21st century challenges gives idea to improve relationship between employees and organization, which are two interrelated factors that are important .

Literature Review

There are several studies on developing a leadership style to fit 21st century challenges. Few of them are highlighted as:

1. Victor E. Dike^{1*}, Ken Odiwe² & Donatus M. Ehujor in **Leadership and Management in the 21st Century Organizations: A Practical Approach** This article argues that what makes effective leadership and management in the rapidly changing 21st century organizations include their personality and style of leadership, passion and values, decision-making and problem-solving process as well as their expectations and levels of relationship with their followers. Leaders and managers require a practical approach to leadership and management to substantially influence and motivate their followers to enhance their performance to achieve set organizational objectives.

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2. Bg. Gen. Imre Porkoláb in **LEADERSHIP CHALLENGES IN THE 21ST CENTURY: THE FUTURE OF INTEGRATED LEADERSHIP APPROACHES** give idea with the development of society, more and more domestic and international corporations arise. In his article, the author argues that in the contemporary complex our organizational and leadership methods are quickly becoming obsolete. He takes us through the leadership theory development of the last century and focuses on the newest leadership trends, where every organization has to make sure to treat all personnel as potential leaders and provide them opportunities to grow and learn. Such circumstances preclude direct hierarchical bureaucratic supervision, and leadership must rely on the expertise of employees with selective skill-sets and experiences. The author presents an integrated approach to leadership, and suggests that understanding, developing and practicing integrated leadership will better prepare all leaders to handle difficult situations under pressure.

3. Mohammad Anisur Rahman in **A Comprehensive Model of 21st Century Leadership** has been trying to understand and explain leadership, however, differences in opinion and isolated ideas failed to demonstrated a comprehensive process of leadership that make an ordinary person a leader or an ordinary leader an effective leader. Comprehensive leadership model tries to portray a complete view of leadership that integrates all the isolated opinions of experts that can be generalized in different perspective. Under this model leadership constitute of four building blocks: traits & style, wisdom, media effects and followers. In the first cycle of the model through these building blocks an ordinary person becomes a leader. To become effective leader one needs consistent repeated performances. However, there are some impediments that hinder consistent performance. Learning to cope up with the barriers may lead a person to become an effective leader.

4. Frank Owarish in **e-Leadership for the 21st century: coping with new challenges** gives idea about the things in which Leadership has always been a crucial factor in the advancement of society as a whole and of specific segments thereof such as government organizations or business companies. No entities can progress without leadership. Studies have been undertaken over time to capture the essence of leadership and much has been written about the subject which is even taught in several universities. Leadership can be exercised by a single person or by a group (collective leadership such as that of a university senate) depending on the context. There are also different expectations from leaders depending on the particular social-political context. As society has evolved and become more complex, leadership has become more demanding.

Before the study it is essential to know what are the aims and objectives of qualities required for good manger.

The main objectives for developing a leadership style to fit 21st century challenges.

- a) To make a uniform and skillful system involving all the leadership styles and standards across the country in the country.
- b) To improve the basics & deep knowledge with quality procedures across the country in the country.
- c) To minimize the efforts and improving the skills for organization of leadership style.
- d) To replace a lot of other patterns to reduce efforts of organization
- e) To detailing of most of the styles of good leader.

- f) To improve the effect of the leadership style for the improvement of each and every area.
- g) To improve the competitiveness of the students.
- h) To ensure the availability of knowledge for the improvement
- i) To reduce the complications in the system and organization
- j) To decrease the unhealthy competition among the organization due to unawareness of developing a leadership style to fit 21st century challenges.
- k) To reducing the management problems to avoid further issues.
- l) To simplify the process of selection of the good leader for the organization.

Thus, there are many good and beneficial aims and objectives of developing a leadership style to fit 21st century challenges.

Aims and Objectives of the Study

- a. To explaining about leadership style required for to fit 21st century challenges.
- b. To study about the awareness of leadership style for the organization for the good leader.
- c. To study of skills, responsibility, knowledge of good leader for the growth and development

Hypothesis

- a. There is not clear picture of about leadership style to fit 21st century challenges to the all sectors.
- b. Students, employees are not having proper knowledge of about the style required for the leadership to fit 21st century challenges.

Methodology

Data was collected from several books and Internet. The list of the papers are mentioned in the references.

Results of the Study

There are a so many leadership style to fit 21st century challenges



Image 1.1 Developing leadership style to fit 21st century challenges.

Types of Leadership Styles

- Laissez-faire Leadership
- Autocratic Leadership
- Transformational Leadership
- Strategic Leadership Style
- Democratic Leadership

- Facilitative Leadership
- Cross-Cultural Leadership
- Team Leadership



Image 1.2 Different leadership style to fit 21st century challenges.

There are main 3 leadership styles authoritarian, democratic, and laissez-faire. There are a so many leadership style among which 3 most important are studied and explained below:

1. Authoritarian Leadership Style

1.1 Characteristics of Autocratic Leadership

1. Autocratic leader take very less or no inputs, ideas from the other group members.
2. Autocratic leader take all the decisions which required.
3. There is less or no trust on any other group member
4. The work strategies are very strong and maintained in one formats
5. They used to follow rules, regulation.
6. No creative or different style of work is preferred.

Under stress conditions and at strong positions Autocratic leadership style will be beneficiary. Leader should have knowledge about his field as there are different sectors like Engineering, Marketing, and Medical etc. there should be practical and theoretical understanding of subjects. There should be familiarize, awareness of all the areas. There should be a technical knowledge in there sectors. There should be general knowledge of things around the sectors to improve the growth of organization. It is used were small group of people are working or lack of team coordination. at manufacturing and construction work this style is very much used. This type of style discouraging group people inputs so sometime it will problematical when some skilled members are presents. Thorough these type of leaders are very negative styled but some time they are used for quick decisions, strong work.

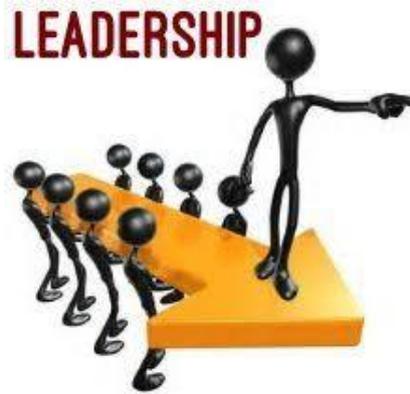


Image 1.3 Authoritarian Leadership Style to fit 21st century challenges.

2. Democratic leadership style

2.1 Characteristics of Democratic Leadership style

1. Democratic Leadership style includes members of group are encouraged to share their thoughts and things.
2. Group members are very much active.
3. Encouraged and rewarded the Creativity of group members.

Good leader of organization with group member .to achieve the goals and target of organization they encourage the employees. Leading team, leading employees in effective way & manner. Supporting other employees and evoking other for the growth. Understanding there problems and leading them in the area of each sector to build team. There should be control on team, one should give good guidelines for the growth of organization.



Image 1.4 Democratic leadership style

3. Laissez-faire leadership style

3.1 Characteristics of Laissez-Faire Leadership

1. Very less guidelines from leaders.
2. Completely free for followers to do decisions
3. Laissez-Faire Leaders provide the tools and sources needed for the development
4. Solve problems on their own by Group members are expected.

For the growth of organization group members should have quality of communication with leader at start of project. Leader should communicate those priorities to each member of team who is responsible for each and every task. Group members should have excellent communication skills. Leader should get there team on same page so that they can work on same objective. Leader should communicate verbally as well as in written format very effectively.



Image 1.5 Laissez-faire leadership style

Findings

- 1) There are many cases in which students themselves are confused about developing a leadership style to fit 21st century challenges and norms of it. Therefore, students knew only that these are basics needed.
- 2) What is exactly leadership style to fit 21st century challenges very few of know
- 3) As developing a leadership style to fit 21st century challenges is basic & deep concept, it will not take time to understand to the students, employees also in the point of view of its organization.
- 4) It is not simple and easy to understand the styles, responsibility but we can understand and apply to improve the growth.
- 5) Overall study shows that early stage of developing of leadership styles will be a part of creating complication in the mind of students.
- 6) There are negative approach and views of students, employees about leader and its role responsibility and qualities.
- 7) Lack of facilities is also one of the major reasons to make students unaware about developing a leadership style to fit 21st century challenges.

Suggestions of the Study

- i. It is essential to give training for improvement of developing a leadership style to fit 21st century challenges.
- ii. Need of counselling and communicating to all level of fields about developing a leadership style to fit 21st century challenges and its benefits.
- iii. It is necessary to inform the students, employees about the qualities and its effect is more advanced and innovative than normal terms.
- iv. It is essential to convey all the students, employees to make aware that there is no exemption from improving styles to anyone, so they should prepare themselves with positive attitude towards the use of it.
- v. It needs to go time to understand the particle skills, responsibility, growth from the developing a leadership style to fit 21st century challenges and its effects to students, employees.

Conclusion

There are several cases within which students, employee themselves are confused about developing a leadership style to fit 21st century challenges and its skills, responsibility of it. Therefore, students knew solely that these are some of styles required. What's precisely some of important styles and its applications only a few of apprehend. It's not straightforward and simple to apply leadership styles so the idea of developing a leadership style to fit 21st century challenges is very much necessary for the improvement. There is

negative approach and views of scholars concerning qualities, skills which will defiantly be a disadvantage. Also lack of facilities is additionally one in every of the foremost reasons to form students unaware concerning of styles. Therefore the detailed and simpler way of developing a leadership style to fit 21st century challenges is necessary for positive approach of the students. So that it will get easier and fully acquired by the student which will help them overcome the phobia of the skills or developing a leadership style to fit 21st century challenges.

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An Exploratory Learning Of Small Business Internet Commerce Issues

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Abstract: *E-Commerce improvement provides a definite path for firms to address the difficulties of the regularly evolving condition. It gives powerful and best methods for example; purchasers could accumulate data quickly about the accessibility of the items or benefits, assess, or consult with merchants. Nonetheless, past examinations on Small and Medium Enterprise in Bangalore. Have demonstrated that the utilization of internet business is still at its early stages. Along these lines, this examination researches the use level of web based business application for the SMEs in particularly Bangalore. This accomplished with the help of coursing a lot of poll to inspect the mindfulness and appropriation of online business application by the SMEs, and perceive the blocking variables to receive web based business and the view of web based business benefits towards joining internet business in the respective business. The examination found that the mindfulness and reception stage amongst the SMEs are continuously in its earliest stages, in spite of the fact that the potential advantages were seen to be significant.*

Keyword: Small and Medium Enterprises, Electronic Commerce, Challenges

Introduction: For a considerable length of time, firms have utilized different specialized devices to direct various types of business exchanges. Banks have utilized EFTs to provide movement client's cash far and wide, numerous sorts of organizations have utilization in EDI to place requests and send solicitations, and retailers have full utilization Televisions based promoting to create phone based requests from overall population for different kinds of product. It is progressively and generally acknowledged that it is significant for business to grasp internet business and embrace web based business applications. Online business applications incorporate scanning for items, administrations or data, publicizing and the purchasing, sell and pay for items as well as administrations. This is especially significant for independent ventures. They might not have the adequate store and ability to construct refined web nearness. Yet, they have to embrace online business applications since it is significant for their on-going survival. It shows improvement of the capacity to contend with the bigger associations and furthermore empower them to do working on a global scale. Furthermore, web based business applications give a practical way to have dealt with little associations to showcase their business, dispatch new items, improve interchanges, accumulate data, and recognize potential business factors. Online business has been hailed by numerous individuals as an open door for creating nations to increase a more grounded solid footing in the multilateral exchanging framework. Web based business could do assumption an instrumental job in helping creating financial aspects advantage more from exchange (World Trade Organization-2012). The developing utilization of the Internet, tablet gadgets with bigger buyer certainty would watch that web based business will

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proceed to do advancement of features and growth. With online life developing exponentially as of late, the discussion among organizations and buyers

Literature Review: There is no broad recognized significance of online business. Laud-on (2002-2003) portrayed web business as deliberately engaged business trades between and among affiliations and individuals. Schneider (2002) has depicted online trading as trade exercises drove utilizing electronic information transmission advances, for example, those utilized in the Internet and the World Wide Web to finish and improve business structures. Bangalore External Trade upgrade Corporate division Fewer examinations have been finished in the specific setting of Small and Medium Enterprises as a lot of studies grasped to date in electronic business territory has kept an eye on the specific setting of enormous associations or those that are dot.com players. With the ultimate objective of this examination, Small and Medium Enterprises are portrayed as having a yearly bargains turnover not outperforming RM25 million and full-time agents not outperforming 150 and must be selected under the Companies Act 1965. Besides, in any occasion 65% of the qualities in an association must be held by Bangalore occupants and working in a supported explanation (SMIDEC, 1997). In Bangalore, Small and Medium Enterprises ,expect a tremendous activity in the country money related improvement, particularly in the amassing divisions Small and Medium Enterprises execution in collecting division in year 2002 exhibits that Small and Medium Enterprises yield created by 2.50%, an extension from RM60 billion out of 2002 to RM62.40 billion (SMIDEC, 2002). It demonstrates the centrality of SMEs territory that inciting a faithful improvement in examinations of web business allotment by such firms. An examination of Jevons (1998) suggested that Internet make an outstanding open entryway for autonomous dares to exhibit responsibility in national and general displaying endeavors that as of now would have been extravagant.

Methodology

Given the absence of exact research around there particularly in Sabah, an exploratory examination was viewed as the most legitimate methodology. In synopsis, information was gathered utilizing postal survey. An aggregate of 250 surveys were conveyed to organizations in which 50 reactions were returned yet just 200 of the returned reactions are usable.

Findings and Discussion

The aggregate of reusable reactions got was 200. These respondents were from six noteworthy territories in the Tamilnadu, Karnataka and Bangalore

Table: Companies Location

Valid	Frequency	Proportion Rate	Validity	Cumulative proportions
Tamilnadu	110	55	55	52.55%
Karnataka	15	12	12	60.25%
Bay of Bengal Area	35	7	7	77.20%
Bangalore	40	26	26	92.00%
Total	200	100	100	100.00%

Impacts on the sampling distributing for the four major areas. The responses received were then divided into sectoring.

Need of Electronic-commerce

With the expanding dispersion of ICTs, all the more explicitly the World Wide Web, the worldwide business network is quickly turns towards firm-to firm electronic-Commerce. The purchasers increase a reasonable bit of leeway when the Internet provide them access to the worldwide market, analyzing costs crosswise over districts, see if costs shift by request discontinuance and get mindfulness about substitute items. Because of straightforwardness of the market, client could look at the administrations of different web based business destinations effectively. For moment, if there should be an occurrence of online business the contenders are a single tick away from client. On the off chance that customers are not content with the items, costs or administrations offered by a specific web based business website, they could vary substantially more effectively than in the present form.

Adoption of Electronic Commerce Application

The result in association with this request demonstrates that the utilization level among the associations in online business applications is still extremely low. In using Internet for exhibiting, a high rate (42%) of the respondents grasped this application to do assessment on contenders, 35% used to do investigate and survey new suppliers, and 33% used to do ask about on customer tendencies. The figures showed up here addressed the current situation in West Coast of Sarah as strong test between the SMEs presence especially in this outskirts less time, each endeavoring to have an edge against the others especially to the extent assessing and things. By doing research on their adversaries and customers, they would have the alternative to get comfortable with them and this would help them in their exhibiting methodology. In advancing through Internet, 45% of the respondents demonstrate their association information and the things/organizations offered, while simply 15% use e-stock as a kind of electronic publicizing. Regarding web facilitating, 25% respondents possess their Web website facilitated by their very own server, 25% selected to possess their Web webpage facilitated by another get-together and 18% of the respondents promoted on the outsider Web website. These outcomes showed that regarding electronic-publicizing, high level of the respondents show organization data and items or administrations offered, as this is the least expensive mean of promoting over the social media.

Electronic Commerce Factors of Hindrance

The respondent's criticism on the impediment factors that would impact the selection of web based business. The data demonstrates an uncertain reaction. The main decisive outcome is that 55% of the respondents felt that a noteworthy inhibitor to the reception of electronic-business is the shortage of security to avoid hack and infections. Other generally critical constraints are:

1. Organization market needs high level of human cooperation (45%)
2. Electronic-Commerce usage were seen expensive (42%)
3. Lack-age of inside ability to execute web based business applications (40%)
4. Lack-age of industry gauges/guidelines from governance on online business (43%)
5. Difficult to legitimize the expense with wanted advantages (40%)

Beneficial impact of Electronic Commerce

There are a few advantages that have been introduced to the respondents on the way they saw the potential advantages of electronic-business. It very well may be reasoned that by and large, the respondents have an inspirational standpoint towards electronic-trade and

view the advantages of electronic-trade as critical to their firm. All application are referenced with all the understanding audit whether full understanding or fractional understanding or not to concede to yet just the principle ideas are being meant.

Application	Strongly Agree	Disagree	Moderate	Agree
Senior management do not perceive E-commerce	15.25	23.00	11.00	34.00
Recommendation of highly human interaction	23.40	34.06	23.22	29.04
E-commerce will upset existing channels	30.30	76.23	89.23	34.09
Lack age of security in e-commerce	56.02	38.77	21.00	55.00
Lack of funding in e-commerce	69.00	21.90	19.25	21.00

Challenges in E-commerce

The genuine troubles looked by the sellers and the buyer which assisting business trades through web are according to the accompanying.

1. Private and open organization is excluded together to build up the presence of electronic business. Privately and openly jointly performed action is relied upon to develop the online business. Joint exercises bring legitimacy inside people, which is required for flourishing the online Organization.

2. There is a nonattendance of system security, steadfastness, standards, and some correspondence show. Customer loses their money if the webpage of electronic business site is hacked. Most typical issue of electronic business site isn't having enough advanced security.

3. Money related foundations and agents: Thus far, budgetary associations and banks in making countries are hesitant to play a working activity in propelling electronic business. Regardless, shippers need the incorporation of banks to extend the degree and interest of web business and to help dodge blackmail and potential incidents attributable to MasterCard distortion.

Conclusion

The utilization of internet business by Small and medium enterprises in the Bangalore is still in its earliest stages in spite of different government activities and consolation. These incorporate the foundation of Sabah Institute for Small and Medium Enterprises in which the reason for existing is to improve the job of Small and medium enterprises in the advancement of the state economy and furthermore fills in as an impetus to create progressively aggressive. Utilization of web based business for reacting to contenders, giving upgraded client benefits and improving associations with providers was driving the take-up by littler organizations. As its utilization is ending up progressively basic to the activity of Small and medium enterprises, it would along these lines appear that Small and medium enterprises undoubtedly see web based business as an open door for improving

their exhibition. The examination additionally found that the potential advantages were seen to be significant, in spite of the apparent constraints of not embracing web based business applications. It is currently up to the Small and medium enterprises with or without help from the legislature or different impetuses to utilize this innovative device to improve their business scope. There has been absence of research attempted especially to decide Small and medium enterprises view of the advantages of web based business and the momentum level of internet business reception. This examination was performed and it is suggested that the future research can be reached out to all the five divisions so as to acquire an increasingly delegate results. The selection considerations and advantages acknowledged from online business may be relied upon to shift as indicated by the business area in which a firm works.

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