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Implementation core Business Intelligence System using modern IT Development Practices (Agile & DevOps)

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Abstract

Throughout the growth of the competitive world environment, there is substantial pressure in most of the organizations to create their strategic, operational and tactical processes to be more effective and efficient. Business intelligence system is a cluster of elements that can escalate the effectiveness or competitiveness and even bring better information that can be used during decision making. Subsequently, most of the organizations choose to instrument or implement Business Intelligence System for them to enhance the efficiency and effectiveness of their operations. Conversely, the absence of attentiveness and diverse perplexing issue which surrounds the process of implementation may be challenging for the entire process. Moreover, the issue that arises due to lack of strategic success appears to be a serious impediment for implementation process of Business Intelligence System. Furthermore, implementation of Business Intelligence System has impacts on the organization and these impacts are linked the consequences of the business strategies. Accordingly, this challenge is grave and significant for the organization to deliberate during the time that they are implementing a new Management Information System. The major purpose for this report is to present the challenges or issues that an organization can come across when impending Business Intelligence System as well as the major issues to efficaciously accomplish Business Intelligence System implementation. Those challenges as well as the success aspects are all done basing on the research framework. Additionally, this study accesses the explanation of the impacts of implementation and the concerns that affect the whole organization and organization's processes. A substantial force has mounted in most of the organizations in order to make sure that the tactical and operational processes are efficient and effective by using Business Intelligence System in order to upsurge their effectiveness/ competitiveness and obtain correct information for making decision. This research has recognized numerous skills which are important for implementation as well as organization of core business information system. Moreover, this research establish some of the skills which are important in implantation process of BA solutions effectively and these skills are in quality management, resource planning, cost management and time management. Nevertheless, this paper also describe the management skills that are used for enhancing the clarity of the project and preventing the issues of broadening the opportunity and risk management aids in minimizing the risks or prevent it totally. In addition, this paper describes some of the skills that are needed by data analysts for the appropriate used of the implemented BA system in an organization. The skills that the report has identified comprises of reporting skills, communication skills, integration skills and technical skills to provide the skilled personnel to report to the senior manager. There are other platforms that will be discussed in this paper like DevOps, Microsoft BI, .NET and others.

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INTRODUCTION

Business intelligence systems enable the decision makers to evaluate and know the effect of the business operation. Preferably, the software that are used in business intelligence systems assist in transformation of data from several sources into useful information and allocate the information to other departments where it is required in order to enhance the precision and suitability of making the final decision (Watterson, Shadish, & Wells, 2000). Additionally, Business Intelligence systems play a major function in e-commerce and these systems improve the whole operation of an organization (Watterson, Shadish, & Wells, 2000). On the other side, the implementation of SAS system would assist the organization to spot the tendencies in the consumer's behavior in the fledgling demographic and take advantage of the opportunities which the SAS system will examine in order to increase the market share and organization's profit. Therefore, this report seeks to evaluate critically the project management and the planning skills that are vital for the implementation and deployment of BI systems and the assessment skills required by the data analyst to appropriately utilize the system which the organization has implemented (Pinto, 2012). First this report assesses the management skills and project planning skills and afterward it evaluates the skills that are required by the data analysts to apply in making operative usage of Business Analytic system that the organization has implemented. Finally, the report offers the conclusion part and recommendations that are important for implementation of BA systems to be successful.Power BI or Microsoft BI is a platform that enables the users to envisage and construe the data with the highest rate, perspective and the performance. Within a short time, you can observe the data in another form. In this report, we will discuss on other platforms such as DevOps, BI, .NET among others.

Project Management and Planning Skills Necessary for BI Implementation

Cost management

The cost management skills is one of the most vital skills that should be taken into consideration when implementing BI system and these skills are used in conducting a cost benefit evaluation for determining whether the organization's project is sustainable or not viable (Pinto, 2012). In that case, the knowledge of accounting is important for tracking the costs that are used and determining whether there are some of the discrepancies which may interfere with effective implementation of Business Information system in the company. Moreover, the organization may escalate its value plan and costs involved via sensible allocation of its budget concern with IT (Burke, 2013). Mostly, the costs that are involved in implementation of BI system comprises of the cost of implementation, the cost of buying the SAS software, license fee and the cost of updating the hardware etc.

	£	Controlled by
Purchase of SAS	350,000	Project Sponsor
Implementation	250,000	Project Manager
License Fee Per Year	100,000	Project Sponsor
Staff Training	60,000	Project Sponsor
Maintenance Fee Per Year	50,000	Project Sponsor
Hardware Update	50,000	Project Sponsor
Contingencies (10%)	86,000	Project Manager
Total	**946,000**	

Fig1: The cost of Implementing SAS

With the inclinations towards the constricted budgets, organizations should emphasize on influencing their resources via enhanced planning and cost management skills. These kinds of BI inventiveness will escalate the processes involved in business effectively (Burke, 2013). On the other hand, IT budgets being expurgated and expenditure for the premeditated projects being under increased valuation, organizations should look for new

approaches for controlling their costs. In that case, organizations keep their costs reduced through influencing harmonizing initiatives, performing consolidation and improving coordination (Jaber, Ghani, Suryana, Mohammed, & Abbas, 2015). However, cost management for the BI implementation and data warehouses at the level of an organization is vital since it goes beyond the mutual aggregate cost of ownership workout of creating Information Technology structure more effective, to making the processes involve in business much effective (Martinsuo, Korhonen, &Laine, 2014). Dissevering and enumerating the numerous constituent of determinations will assist organizations to be able to manage their costs more efficiently. Moreover, through the selection of technology together with the arranged plan, organizations can reduce the number or the products that they require and in that case, organizations can be able to minimize the costs of administration and maintenance costs. On the other hand, employing several BI solicitations together with strategic topology can improve the ROI (return on investment). It is however more vital for an organization to achieve coordination between the projects and within the same projects-like CRM (analytic customer relationship management). For instance, a client serving on Gartner had department of sales comprising of 24 diverse data salesrooms which were firm in design and not able to change the processes of business basing on the outcomes from the assessment. Another organization had sales departments comprising of 17 diverse salesrooms (Khodadadzadeh, 2016). In that case, the implementation costs and maintenance cost for such a topology became unaffordable and forces organizations to unbending behavior which develops much of the anarchy than improvement.

Even organizations having the superlative implementations may allocate their budget for IT more sagaciously by encompassing the costs and aggregating the value proposition. Moreover, the costs may be decreased for all features of a BI approach, comprising data structure, which is data marts and DWs; mining, conversion and filling (ETL) progressions; and BI applications and tools. Organizations that analyze the initiatives of BI purposefully will have the capability to know where they are spending more money. A substantial share of DW costs re-counts to the ETL progressions and finding the data from the functioning source solicitations to the aim DW (Khodadadzadeh, 2016). All of these costs comprises of costs of tools, software, hardware and staffing. There are some of the ways that are used in reducing the costs of ETL elements found in DW structural design, comprising restructuring the process. Most of the organizations, for the past years assimilated BI tools that can use important management resources. Organizations must decrease the number of the tools as well as their cost by avoiding fragmentation, making tough decision, evaluation and planning. Moreover, organizations can reduce the costs through data mart amalgamation, eradicating technology and decreasing staffing, as they delivers suitable executions that meet the requirements of BI. This is much more than a methodological problem (Kerzner, 2017). It is also political and cultural problem which could comprise merging several departments.

Project Scope Management

Project manager must make sure that the project comprises of all the activities needed to accomplish the implementation of BI project effectively. In accordance to Pinto (2012), it is more significant that the organization manage the project scope due to the reason that the scope assists in preventing the issues that can be encountered throughout the process of completing the project (Pinto, 2012). Furthermore, the project scope management skills allows the project manager to effectively communicate with the project team concerning what should be included and what must not be included and controlling what is added or removed when implementing the Business intelligence project. In the existing project, the scope management skills will allows the project manager to take account of all of the activities, for instance purchasing SAS software, maintenance and licensing annual fee, training the staffs, execution and exigencies in order to make sure that there is successful accomplishment of the project (Wang, Su, Ma, Wang, & Wang, 2011). Moreover, the scope management skills are important for the leader of the project to avoid such issues of the scope tiptoe in BI project and make sure the Project accomplishment has been done within the stipulated budget and on time.

Risk management skills

Business intelligence project needs risks management skills in order to ascertain, forecast and respond to the possible risks that may arise during the lifetime of the project (Virine&Trumper, 2013). Management of risks requires identification of the risk, prioritizing grave risks, examining the risks towards choosing the response instruments and checking the developed solutions of solving the issue. Virine&Trumper(2013) suggest that a

number of the risks that are encountered during BI projects most of the time arises from the data collected. Therefore, this needs to be defined clearly by the project manager. In that case, project manager have to define plainly the magnitude of the limit of the risk which the project itself is able to acknowledge in order to choose on the likelihood plan if there will be a possibility of the risk to occur (Virine&Trumper, 2013). Most of the risks that may occur during BI solution implementation comprise of huge costs, privation of appropriate implementation, disagreement that exist between the organization performing implementation and SAS and finally lack of training personnel as illustrated in the following figure.

Risk ID	Risk Description	Likelihood (L) (1-10)	Impact (I) (1-10)	Exposure (L x I) (1-100)	Owner	Mitigation/ contingency plan
R1	Price is too high	7	10	70	M&S CEO	Update the CEO regularly on prices
R2	Schedules are not able to be created or within the time frame	6	7	42	M&S employees, SAS engineers	Ensure the engineers and employees send us their schedules
R3	SAS and M&S do not reach an agreement	4	10	40	M&S CEO, SAS Institute	PD Solutions will act as mediators
R4	Implementation does not meet target criteria	3	8	24	SAS engineers	Regular progress updates
R5	SAS system is failing testing	2	9	18	SAS engineers	Quality control every stage along the way
R6	Employee training is unsuccessful	2	6	12	M&S employees and SAS trainers	Regular progress updates, make sure every employee attends

Fig4: Risk Management Approach

Every single project is subject to various risks which are inevitable. Most of these risks can interfere with the schedule of the project and it can also impact on the project deliverables, depending on the probability that the risks will emerge and on the effect the risks will have on entire project. Thus, risk evaluation conducted in phase 1, BCA (Business Case Assessment) should be studied and if necessary it should be expanded. The role of project manager is to classify the prompts for every risks and integrate a modification plan as well as the possibility plan into the project plan (Martinsuo, Korhonen, &Laine, 2014). Prompts/Triggers are the conditions that shows signs of probable, possibly impending appearance of the risk. For instance, in case the management is revising the budget stipulated for the project without deceptive reason, this suggest a potential prompt for the risk of bringing up the rear management upkeep for organization BI project. During risk management, the mitigation plan lay down what activities the project team can do in order to avoid the risk from occurring. As by the example provided above, the organization can implore support from the project sponsor and endorse the initiative of BI to other significant officials in an organization in order to retain the interest of management in the BI project (Fischhoff, Brewer, Downs, & United States, 2011). However, in case the project seem to be in misfortune, the risk of having it void/cancelled is prevented or mitigated. On the other side, contingency plan lay down other possibilities if the risk does occur. For instance, in case an organization lose the support by management for the BI project because of a long schedule for the project, the plan to cut the release successions by providing a less significant scope earlier (Göllü, 2017). In case the organization lose the support of management because of the exit of the project sponsor from the company, the organization should have an alternative sponsor prepared to be the victor for the BI project.

Most of the risk that can be encountered during the project are as follows:

- Lack of commitment by the management
- Losing the sponsor
- Inadequate scalability
- Enacted, improbable program/schedule
- Lack of participation in the business
- Expectations that are unrealistic
- Scope which is unrealistic for the schedule
- Budget which is unrealistic
- Lack of training the personnel
- Changing the priorities for the business continuously
- Project management being ineffective

Risk Management Process

An organized risk management process is however well-defined for the projects, in accordance to the size of the project, agreement model and complexity of the project. The use of the tools are more important and mandatory as by the project guidelines (Vellani, 2007). The risk management processed should be monitored all along the lifecycle of the project, right from the beginning in the view and proposal stage and ongoing as a steady and methodical process up to the conclusion of the project (Vellani, 2007).

Fig 5: Risk management process

Quality management skills

These skills are important when it comes to managing quality in BI project (Flannes& Levin, 2005). The project manager does everything to make sure that the processes and outputs in which the project is carried are of the highest value and meet the shareholders' needs. Nevertheless, Quality management set up the principles or criterions that are used for quantifying the victory of the project in the company, Moreover, it also assists in assessing the progress of the project against the expectations that are have been set up (Vellani, 2007). However, the leader of the project must make sure that the BI project meets the quality needs right from the initial stage of getting

oriented by clearly defining the scope of the project and maintaining technical execution to the last step of evaluation of the value made by the BI solution. Furthermore, the expectation of quality during the conclusion of the project must be defined clearly during the start of the project so that much of the effort are determined on the quality achievement. In addition, in case it is ignored during initiation stage, it may produce ultimate product which do not meet the expectations of shareholders (Nicholas & Steyn, 2012). Thus, quality management skills are vital for the BI projects to clearly define data accuracy and quality in order to prevent the production of product which will not meet the expectations of the shareholders.

On the other hand, deprived/poor data quality can hit the BI of an organization. Most of the BI projects have been attacked by impediments that are associated with data quality. At times, these complications are never deceptive up to the time the professional users begins to test the system right before working live with the organization's project. There are some two drawbacks when it comes to data quality management and these include data quality being defined too narrowly and assuming that data quality is the role of the main/source system. Most of the people frequently accept that data quality basically means removing bad data –data is not correct, or data is absent. Bad data is definitely an issue, though this is not the only issue. On the other side, good data quality management make sure that the data is accurate, applicable, reliable and appropriate/timely (Flannes& Levin, 2005). When you define data quality intently, most of the time can make individuals to take assumption that source transactional systems whether via entry of data of errors that comes from the system cause bad data. Though they can be the basis of some errors, most expected malefactors are either unreliable definitions for the derivative data through organizations or unreliable scopes all along source systems, for instance client or product/invention identifiers. Creating reliable customer or product identifiers is vital for evaluating and accessing data for an organization. Source systems never possess issues related to data quality through other systems, but the BI project team does so. However, source systems require to make sure that the data that are stored in their databases is accurate (Virine&Trumper, 2013). The BI project team on the other side is accountable for offering the business with the data which is reliable all along the organization.

Time management skills

Time management skills comprises of processes that are needed for managing the project accomplishment in appropriate way. The most important duty of the project manager is to make sure that the project is accomplished with the period allocated for it. For example, the recent BI project is expected to go for a period of even months, which is from 1st Jan of the year 2016 to 1st Dec. of the same year (Kerzner, 2017). Therefore, time management will allow project team to complete the whole project within the projected period of 11 months. In addition, time management skills are important during implementation and deployment processes of a fundamental business intelligence system due to the reason that there is limited time and insufficient labor (Schwalbe, 2016). Thus, timely accomplishment of the BI project will need the project manager to apply Gant chart to indicate the period which every action will take to be completed within the time frame as illustrated in the chart below.

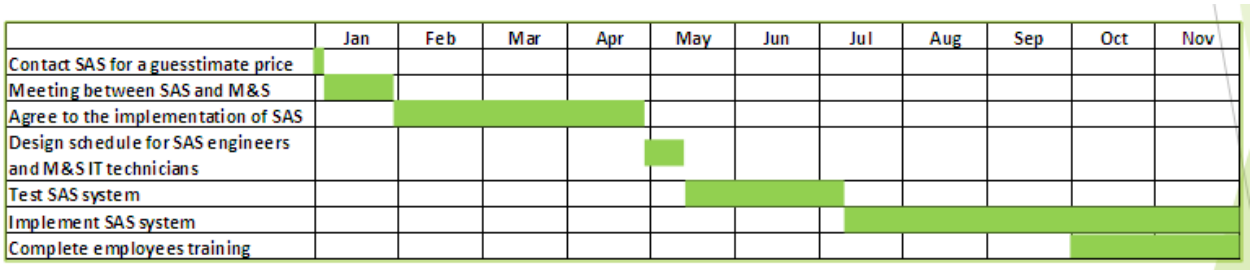

Fig 6: Gant chart

Skills Necessary for Business/ Data Analyst in Organization

Technical skills

These skills are needed by data analysts in order to allow him or her to handle non-programming applications like spreadsheet and conducting deeply the evaluation of the programs (Wang, Su, Ma, Wang, & Wang, 2011). In addition, technical skills are needed by data analysts for upcoming predictions. Furthermore, data analyst need to be conversant with some algorithms like k-nearest neighbor where by k- stands for clustering (Elhamifar& Vidal, 2009). Nevertheless, data analyst require to understand theories and information behind the algorithms but he or she should have the knowledge on when these theories should be employed for the appropriate use of the implemented BI system.

Important Skill Sets for Professionals in Business Intelligence

Big Data has incredible perspective to lead the way towards transformation of business. The total capacity and diversity of data that are being produced in the current environment offers a treasured opportunity for the project managers to evaluate and understand much concerning the businesses. These can in in turn lead to better performance of the business and better decision making (In Tomar, In Chaudhari, In Bhadoria, & In Deka, 2017). The implications that are observed in Big Data are developing large demand for the resources to assist the business use such information not just aggregating it but to know the way to leverage it in order to make well-versed decisions and develop techniques. BI is necessary due to the reason that it contains most of the features that can assist in offering universal perceptions into the business. One of those aspect is information management, which includes checking on data quality and comprises of the processes that the data is being produced, apprehended and finally stored. According to Buschbacher (2016) information management is the prime sector of BI services market. There are other rising aspects of BI and these comprises of performance management which includes evaluation of analytics and financial activities, which balances several skills in analytic approaches and technology with an organization-specific information. The need of BI specialists is just clear. As the organization endures to develop, succeeding in BI can take a blend of technical skills and competences, together with a wider frame of reference for the task and the way it is carried out as well as how it is measured (Wang, Su, Ma, Wang, & Wang, 2011).

For the case of technical skill sets, it can be helpful for professionals to be expert in:

SQL- though they are not used frequently, this language is helpful when requesting information from the databases, deleting and updating and this can solve much of the complex issues.

Relational databases – The limits of operating with table schema of database designer make you to understand that rational database is significant.

Basic skills in programing- Because of fundamental scripting language in reporting software, BI professional should have knowledge in programming.

Reporting Software- BI professionals must be familiar with reporting software and have knowledge on underlying model and application of the reporting software in the market.

Scrutiny skills – In BI, analytics is a subcategory which involves predictions, statistics and optimization - the means to knowledge discovery in business. It can include anything that comes from data mining to analytical modeling and to rigid analytics.

Additionally, BI specialists must shape their skill sets which permit them to lead not just the business but also individuals who are using the perceptions disclosed:

Communication skills- In the report that was written during the year 2012 regarding BI, Gartner, which is the global leading information technology research and recommended organization, suggested that 70 percent of the whole project in this realm are well-thought-out to be failures, mostly because of lack of communication skills (Gartner Group (Stamford), 2000). The BI team of an organization must therefore have a strong communicator as the frontline of each project and the leaders must deliberate training to their project teams in order to make sure that the project basics are all grasped.

Macro-aspects- this is all about implementing a diverse mindset or perspective. The wider or extra team-oriented should have perceptiveness to influence on the business. This is important for the success of BI solutions.

However, the current BI professionals must improve their soft skills as well as technical skills and inaugurate a reverence for the instantaneous data and the significance of likelihood. To that extend, the business can request for the reports and consoles that can deliver information by captivating interfaces and anticipate to receive the information hastily. In order to address this request, the BI teams must embrace a peripatetic mindset (Sampson, 2015). They can succeed the support of team members and shareholders through making their most vital and perceptible applications to be well-suited with tablets and smartphones. However, the brilliance BI projects and business intelligence may make the victory to be challenging metric to be efficiently measured. The main metric is a rudimentary understanding that the inputs of BI must contain a positive impact on the business (Vellani, 2007). When it comes to delivering this impact, it needs profligate user acceptance, the sophisticated the better. Therefore, the BI teams may focus on the outputs of the BI right from the beginning, other than gaining interior management. Most of the current researches reported that 25 percent adoption rate are at the beginning of most of the BI project deployments. During the time that the project teams are delving on BI, they are instead pushing to the user adoption which develops tailbacks and may lead in slip-ups of the project or project failures, for instances incorrect data or lack of performance.

Integration skills

These skills are more useful for data analyst to be able to offer coding, data integration support, and scrutiny for information technology related to relocation of legacy data (Flannes& Levin, 2005). Additionally, these skills allows data analyst to evaluate the store data in databases, identity transformations of data, prepare specifications of interfaces and also useful when data analyst is documenting the integration requirements of data.

Reporting skills

Comprehensive reporting skills are crucial for the data analyst to provide more explanations on technical and complex opinions as well as the methods in an effective and simple language (Flannes& Levin, 2005). In addition, these skills allows data analyst to provide a certified report to the project manager regarding the outcomes that have been generated by SAS in order to assist in making the final decision. These skills also allows the project manager to plan and implement the processes used to report innumerable works and formation and dissemination of the reports to the people concern.

The Concept of Business Intelligence

The concept of Business intelligence can be well-described academically as the use of business application or the use of great software or values to come up with better decisions for the organizations. This is confirmed by IBM. Practically and technically, BI are the tools that are used to collect, process and analyze the data. Through this way, an organization can examine the outcomes and interpret those outcomes(Sauter, & Wiley InterScience (Online service), 2010). Basing on the new technologies, Business intelligence are fundamental for decisional level effectiveness. Additionally, BI systems are used to improve the relationships with the customers, suppliers and employees by: simplifying the process of making decision, lowering the costs, increasing the productivity of the personnel, enhancing partnership and development of business. In order to understand the significance of trend of the business intelligence, it is more significant to understand the most fundamental benefits after utilizing this kind of system.

Benefits of using BI systems.

i. Business intelligence systems facilitate efficient risk management: the value that are passed to the organization managers by using these systems is given by monitoring the hazards which may threaten the strategic goals of an organization and the losses.
ii. Business Intelligence solutions assimilate all the data for the analysis: for instance exports of texts, typical interactive data, excel data to the XML data streams that are kept in the operational systems or databases(Sauter, & Wiley InterScience (Online service), 2010). Through this manner, they are often accessible for the use in Business Intelligence applications.

iii. Implementation costs of BI systems are low, outsized funds are not needed in hardware tools and the training for the users are done within a short period, of which all of these are negligible investments that can be recovered within a short period of the operations.

iv. BI reduces the impact of power knockouts in an organization

v. BI solutions avoid problems during decision making

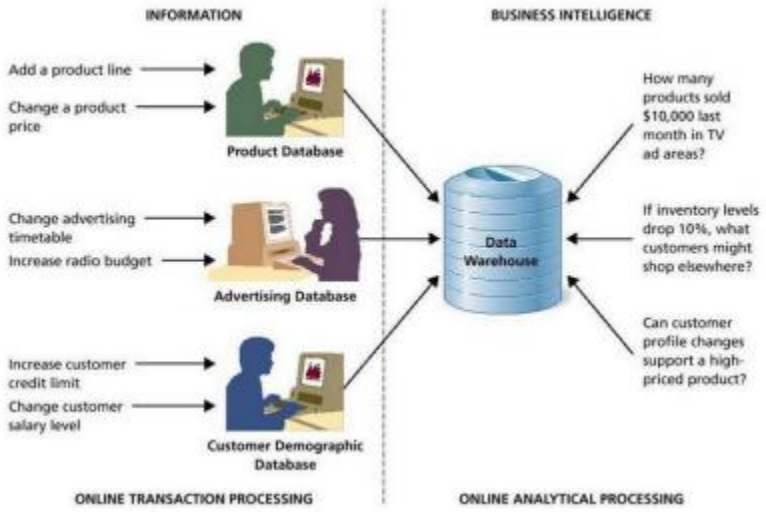

Fig 7: BI process

Choosing a BI Solution

Most of the research currently shows that the current economic activities can generate lots of data capacities. Every data signifies a small part of the business and it is located in some of the departments or locations within the company. With the use of Business Intelligence, all of the data are gathered and processed into information that will be examined and utilized for the succeeding decisions(Sauter, & Wiley InterScience (Online service), 2010). Under today's business surroundings, the timeliness as well as the quality of information is not only the choice between the losses and hard earned profit but is just a matter of training and survival. The important of Business system are clear; the analysts are enthusiastic, showing that in the future millions of individuals will be regular users of BI systems. Within this perception, however is now looking for the most suitable approach for choosing the BI systems. This approach will be modified to the requirements of the company. Business intelligence systems that has no goal and clear end may definitely give a vintage, but will not provide a guide to the company where anticipated, due to the reason that no person know the critical of final goal(Sauter, & Wiley InterScience (Online service), 2010). Therefore, the major step for building BI approach is knowing where the organization needs to reach out and what impacts are expected after BI implementation. In order to obtain fundamental information and present them 'user-friendly' is another significant step to pass in yearning to resolve the BI problem in every company. For instance, the data that are problematic to comprehend can discourage BI users from utilizing such data. It should be noted that bad data which are in the system must be identified, get rid of and substituted.

Development and Operations (DevOps)

Definition of DevOps?

DevOps is defined as the philosophy of merging Developments and Operations at the tool levels, practice, system and culture, to attain enhanced and much more value for delivery to the clients via enlightening the quality to escalate the velocity(Loukides, 2012).The goals of the DevOps is to bridge the gap that exist between IT operations and software development. However, the process is so challenging due to the reason that the goals of both process are comprehensively contradictory. The team who are dealing with operations consider offering a reliable and stable services. Thus, this team avoid the risk and struggle to do the work effectively (De Kort, 2016). On the other side, development group need to react to promptly changing business needs and the team is much fascinated in the debauched cycles to hastily deploy the changes to the fabrication systems Moreover, DevOps handles these defies by inaugurating the culture and process which split the storage tower/silos

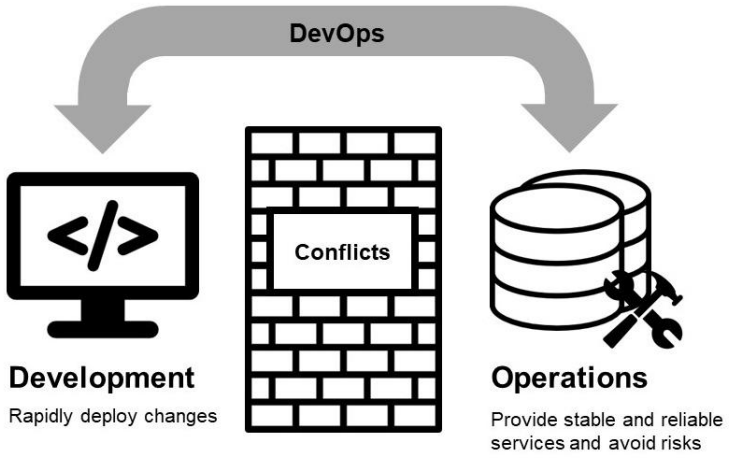

Fig 8: DevOps attempts to bridge the gap that exist between operations and developments

Apart from the holistic and agile discerning, unremitting delivery process has been seen as the fundamental perceptions in DevOps (De Kort, 2016). The baseline of unremitting/continuous delivery process is that the software must be made in such a manner that can be released to the section of production anytime. In order to accomplish this, the organization need a merging culture between the operations and developments. Additionally, the organization need a streamlined Deployment Channel which describes the procedures and as well as automating the process of delivery.

Phases of Deployment pipeline

Building Automation and Constant Incorporation/Integration: At this phase, clarification of new structures are assimilated into the source code(Nicholas et.al, 2012). This phase mostly contains vibrant procedures which are supported with the variety of control and automated testing which make sure that the program function technically, i.e. at the technical level.

Testing Automation:This phase encompasses comprehensive testing which make sure that the platform is function at nonfunctional and functional level and the system meets the requirements of the users (Nicholas et.al, 2012). It implicates manual and automated testing. Additionally, it comprises of some metrics which make sure that there is no feature that is deployed which has not been comprehensively verified/tested'

Deployment Automation: This is the final stage that comprises of the automated rollout for the new structures to the production side(Nicholas et.al, 2012). During this phase, deployment process has been verified and scrutinized and this can be moved to the side of production with no challenges.

Benefits of DevOps

DevOps has some of the benefits for any organization. It enhances communication and collaboration decrease the time from the opinion to the production side and advance the reliability and the quality and decreases the complexities.

DevOps Applications in Business Intelligence and Analytics

DevOps has embraces the impending in BI and the sector of analytics. This part temporarily explains the use circumstances that come from advanced analytics and data warehouse management

Data warehouse management

DW is a fundamental warehouse for the organization data and thus it is the fundamental component of BI project. DW typically excerpts and store the data from numerous sources for it to convert and produce the information for commentary and analytics. Subsequently, Data Warehouses are habitually somewhat refined solutions. Management of this DW may be difficult(Kachur, 2000). The alterations in the Data Ware house at mostly sluggish due to the reason that DWs need to be ratified by several stakeholders. On the other side the process of deployment is frequently complex and it implicates human interferences. However, the organizations need to establish DevOps in order to minimize the cases of complexities and enhance management by bringing together all the parties that are involved. For example, the data analysts can discuss the strategic features with an administrator for database in order to avoid unsolicited consequences during the initial stage. Sometimes an administrator can formulate his or her surrounding for the future changes (De Kort, 2016). Moreover, a rationalized deployment can speed the changes that are in Data Warehouse as well as mechanizing the processes. There are several strategies that come from the data silo automation and these strategies take part in building deployment of BI which can assist in automating the source scrutiny, testing, and certification among others. Finally, the automated testing are much helpful when it comes to dealing with the complexities that are in data warehouse and prevent unpredicted behaviors.

DevOps and advanced analytics

Advanced analytics incorporates most of the refined methods in order to inevitably evaluate the data that mostly goes beyond the traditional BI strategies, for instance data mining. In that case, the data analysts scrutinize data collections and develop algorithms and models in order to find deeper discernments and come up with the predictions or produce recommendations (De Kort, 2016).. More importantly, the procedure for building the algorithms as well as models mostly occurs distinctly from the advanced application. The most common process here is that data analysts develop and drive their models with the chosen test data collections and thereafter deploy the data to the side of production to observe what will occur. This is the hints to achieving better outcomes or real-time assessment. Though when the models seems to out-grow their function and become a significant part of the business, this tactic will no longer be sufficient(Sturm, Drogseth, &Twing, 2015).This is when DevOps-philosophy can be used in order to inaugurate all-inclusive perception on the analytics which are focused on constant improvements and quality. Additionally, DevOps make sure that the quality in maintained and increases the speed. DevOps may assist in finding advanced analytics from the ‘enchanted data science’ turn and establish precise standards and enduring solutions which assert ROI.

Five benefits of Incorporating DevOps with your Business Intelligence Strategy

One. Devops can improve the quality of data in order to enhance situational attentiveness.

In case the data is new, applicable and not corrupted, the outcomes obtain from that data is helpful. The role of outmoded BI solutions is just to process the data in groups. In that case, the freshness and relevance of the processed data, become uncertain (Loshin, 2013). Implementing DevOps mean systematizing the testing of diverse data groups. The current data obtained is much useful when handling several diverse data sets. Therefore, Errors are easily detected before they endanger the systems.

Two. DevOps can assist with improved application level incorporation

The services among the processes of ETL and the middleware and dashboard conceptions are all under BI preview. Communication and discussing agreements among the levels is multifaceted and need more management. In that case, DeVOps assist in facilitating this with continuous deployments and testing process (Loshin, 2013). There are several outfits that can help here such as PACT testing, or Swagger for API, that call be erected into the process of automation testing and it assist in negotiating contracts for API.

Three. Up-to-date architecture through DevOps dids Enterprise inquisitiveness and change

DevOps methodology is a part of Agile-thinking which reassures the development via small incremental stages. Catastrophes are not projected, but fortified (Loshin, 2013). Through application of the same principles to the deployment of BI, companies can be able to customize their own solutions to some extent. Moreover, with extra fail-safe within the DevOps, the organization teams are encouraged to attempt new stuffs. DeVOps lowers risks of making mistakes in an organization. It also helps in fashion BI system.

Four. Data warehouse management is improved by DevOps

DW is among the fundamental elements of BI systems. Due to the reason that DW stores the data from various sources, even the basic Data Warehouse is a multifarious web of guidelines. However, creating some changes to DW is unwieldy procedure which involves taking acquiescence from the shareholders and human interventions (Loshin, 2013). DevOps speeds up Data warehouse management process by bringing together the shareholders and making the shareholders held responsible.

Five. DevOps improves internal communication among team members

Operating with the systems/technologies in Devops advances the credentials and assist motivate and ease communication among the team members. For instance, if PACT testing is implemented appropriately, it will assist the developers to corporate with one another on the contracts much easily as compared with outmoded approaches (Loshin, 2013). Improving inter-team communication also help the company receive and act on the response and this will lead to the satisfaction of the customer and therefore the organization earn higher incomes.

Delivering Agile DevOps in a BI World

Currently, the businesses are changing tremendously at a higher rate. Today's lifecycle of an organization on the S&P500 is at the preset fifteen years (Snyder & Curtis, 2018). However, with the descending trajectory of the occupation and the exponential development of an arithmetical paths, it's is improbable that this tenure will embrace for long.

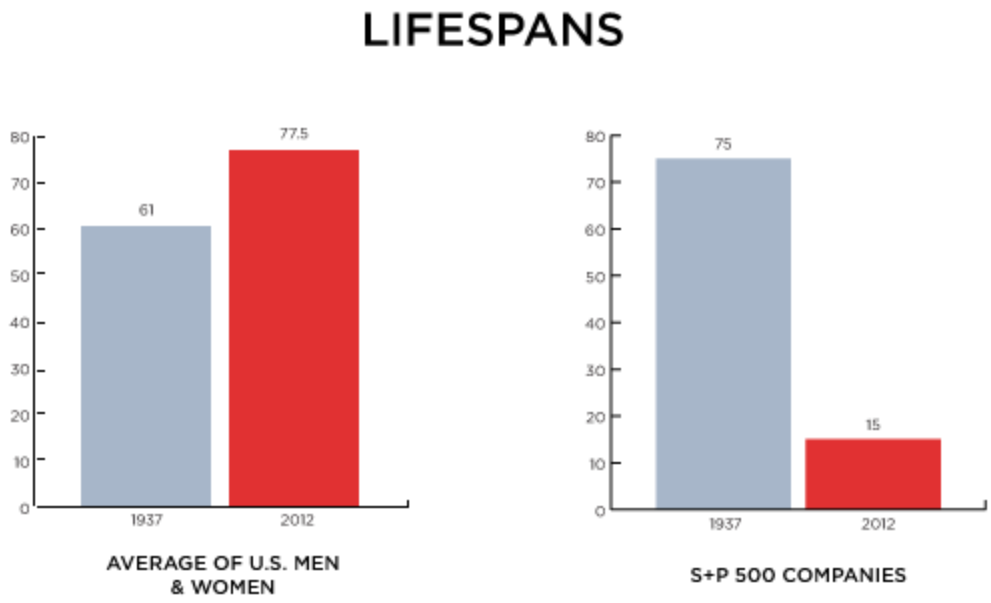

Fig 9: Lifespan

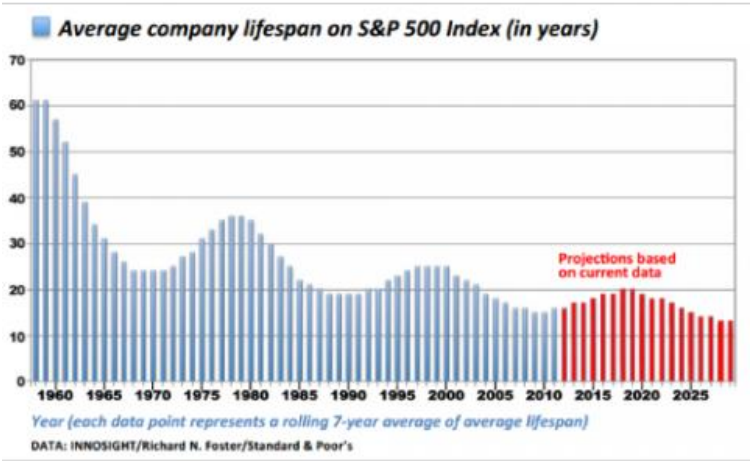

Fig 10: Average Company Lifespan on S&500 in a year

In order for the organizations to be at a competitive edge in the middle of the world disruptors, organizations need to scramble to harness planned and strategic insights from their ever developing data trail. Commercial data reservoirs that hold large amount of data and progress to develop at an exponential ratio with developing technologies like internet of things (IoT) and several internets being embraced(Snyder & Curtis, 2018). The current global needs a digital platforms which allows the agility of the business. Moreover, decisions of the business in the digital era need deep-seated shifts to maneuvers, turning outmoded business on their side, beginning new businesses in a matter of days, with a perpetual transform, assessment, learning the cycles to make the best, make well-versed decisions and get rid of the market competition.

T-Mobile

T-Mobile is a good example of how workers in a company fundamentally changed their company to focus on the target market sector and be the 'Uncarrier'(United States, 2011). To perform this, the T-Mobile need to develop a bank eliminate agreements and do the task with the partners in order to offer free running data in their 'Bender On' operation.

Fig 11: T-Mobile

There is no organization that can drive this transformation level with conservative methods. A progressive manner of thinking, on the future generation podium, with a substantial focus on trialing and swiftly introducing the market approaches and new services(United States, 2011). The outcome are vivid when the T-Mobile escalating the market share within a period of four years from below 9% to over 15% as illustrated in the graph below.

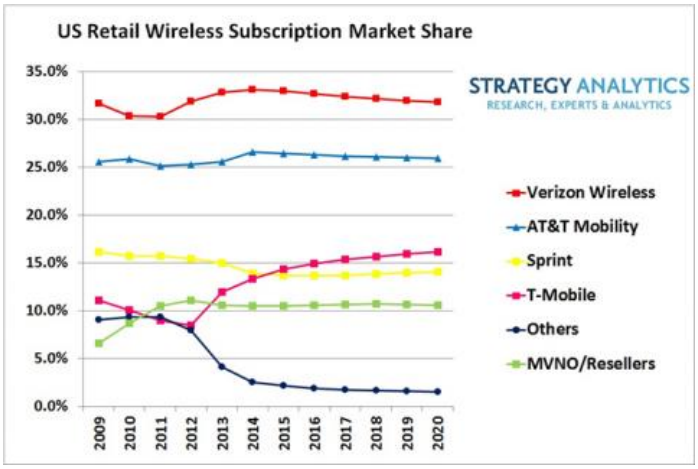

Fig 12: US Retail Wireless Subscription Market Share

The Necessity for Upcoming Generation Platform

Agility is more vital all along the value chain. Most of the inheritance platforms mostly fail to provide the agility that most of the organizations demanded. The revolution of BI is interpreting the traditional strategy which is supported by the inheritance platforms scanty(Pilone, Stern, &Solan, 2000). Vibrant enterprises have embraced the tectonic shift in Business Intelligence and implemented the subsequent platforms, thus upholding the swiftness and empowering the computerized relations.

Features of the new architecture

- The quality of the data is paramount.

- It improve the visualization of data and enhances the options for deployment
- There is continuous management of non-traditional and new data sources by using the concepts of data blending, data virtualization and data lakes.
- There is real-time streaming assessment
- There is Autonomous Decision Frameworks and movement to Artificial Intelligence.

Running this Next Generation Platform in an Agile Model

The most vital benefit of these platforms is that there is essential tractability with a 'structure on read' setup (NoSQL) versus a 'structure on write' setup. Most of the time you don't distinguish the assessment that you are seeking for up to the time you dig onto the data, during the time you find something fascinating or need to discover unambiguous aspect that you need to reorganize the conservative databases which are extremely standardized with the keys and layers(Wright & Moore). Contrarily, the data in databases are kept at their deepest level and organization of the data happen on the structure read format and you can just edifice what you want what you require not the setup of the data. In that case, it will be much bendable for agile model to operate in an organization. However, the turn-around applications is shorter since there is no vital structure with agile model. When it comes to agile model, there are steps that are for the new generation platforms. In that case the organization can be entirely involved and typically observe the lifecycle of the model as being the most efficient approach to operate the business.

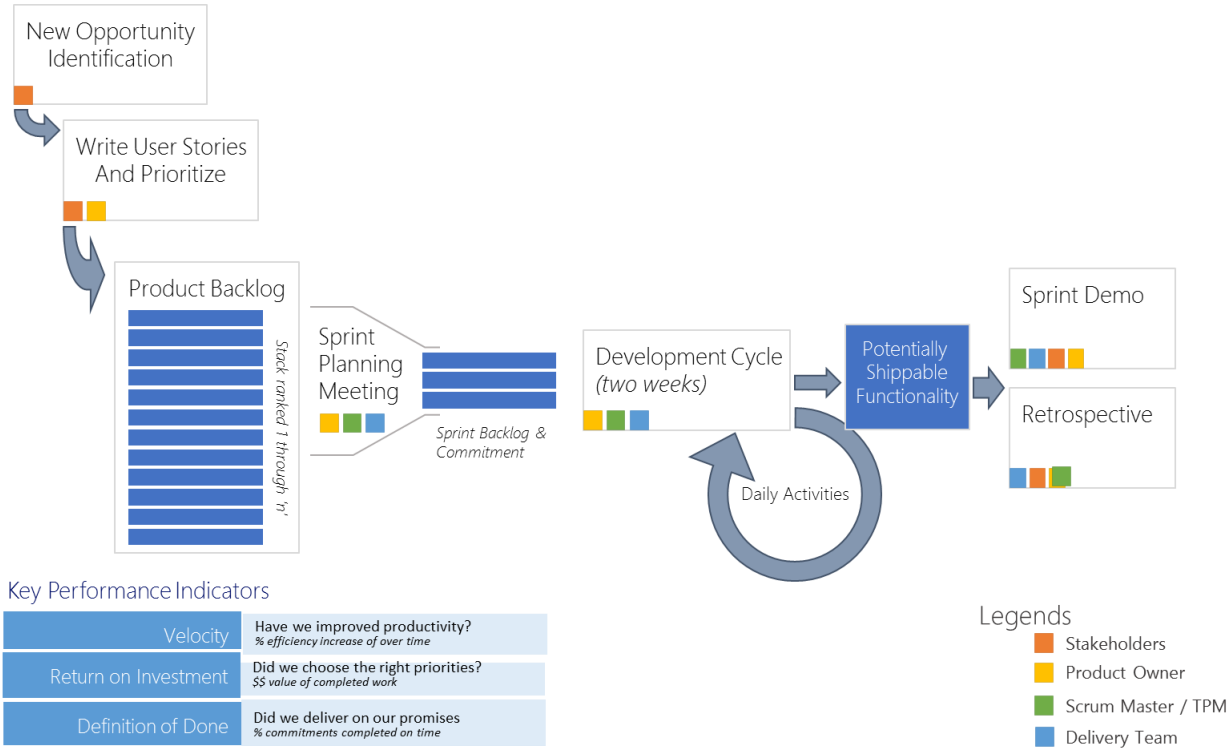

Figure 13: Agile Model

Testing and Deployment Automation

For an operation of a 2 week step, the company require a deployment and automated testing. If not so, much of the time will be used during the deployment process(Wright & Moore). Therefore, it is more significant for the organization to execute automation in order for the important processes to function rapidly. In doing so, the rate of errors will be minimize as the time goes and this will make the team involved to be more effective. Moreover, the automatic testing will offers the analyzers immediate response, thus enabling them swiftly identify and address the issues.

DevOps

When it comes to rapid development, there is no need for separating the support folks and development. The company needs the inventors to be accountable for their proclamations(Armstrong, TotalBoox,,& TBX, 2016). However, there are several advantages for this as the developers bake in the elements to the project and the solutions that make the progress effective. With this approach there is a sense of proprietorship and quality. Furthermore, automation is a fundamental element in moving the people more easily to self –diagnosis and self-service with the ease of using the tools and this makes the support to be much approachable and efficient. Finally, the Agile and Devops have allows the organizations to adapt and learn the global competition.

Advantages of Devops to the company

They figure what the organization requires, provide early delivery, can detect error in time, ensure healthier working interactions between the workers and produce the highest quality output and produce the outcomes which are reliable and comprehensible enabling the shareholders to incorporate corporate planning.

Moving from Application automation to True DevOps by including the Database

There is a budding incentive, in most of the companies, to incorporate database changes into DevOps method. The current State of Database DEVOps Report publicized that in a perion of 2 years to come, 82% of organizations will implement various features in DevOps, and on the other side, 76% of the organizations at present have the designers who operate across databases and applications (Armstrong, TotalBoox,,& TBX, 2016). The main driver for adding the database in DevOps is to accelerate the speed of database changes delivery. However, the prevalent challenges are the apparent difficulties when it comes to overcoming diverse approaches for development, for the teams to take part in synchronizing database changes and application.

Application deployments

In an emblematic application mechanized deployment channel, for instance, the deployments are connected to the source controlled forms of application code for the alterations that are made during development process may be linked to what has already been deployed (Castillo, 2017).

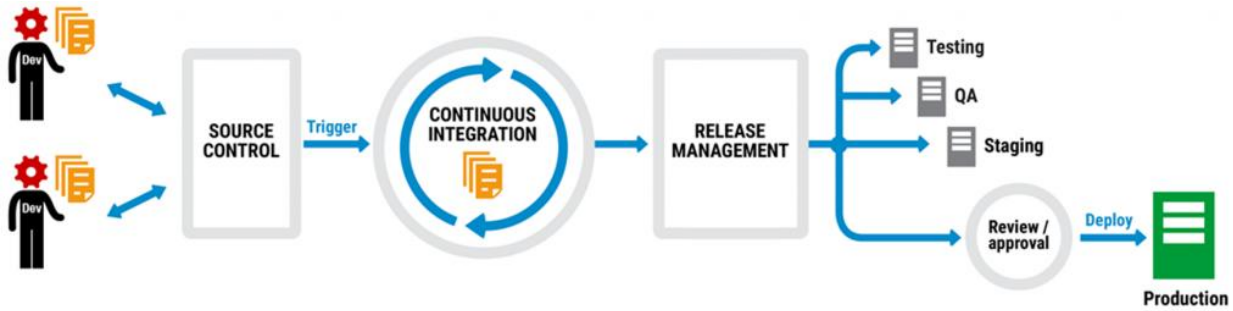

Fig 14: Application Deployment

Database source control methodologies

When an organization want to do away with the present database and develop new version, the organization will require SQL DDL scripts in the source control. This will help to describe the present condition of each database object and automated approaches to generate database object in the precise dependency order (Siau& IGI Global, 2013). SQL Change Automation is a tool that function unswervingly in Visual Studio. This tool also automatically generates statistically the relocation texts/scripts by using a standard SQL Compare tool. Every changes that are made alter the commands. The changes are arranged in SQL characters and run them in order at the time of employment, to move the database from one version to another, but preserve the organizational data.

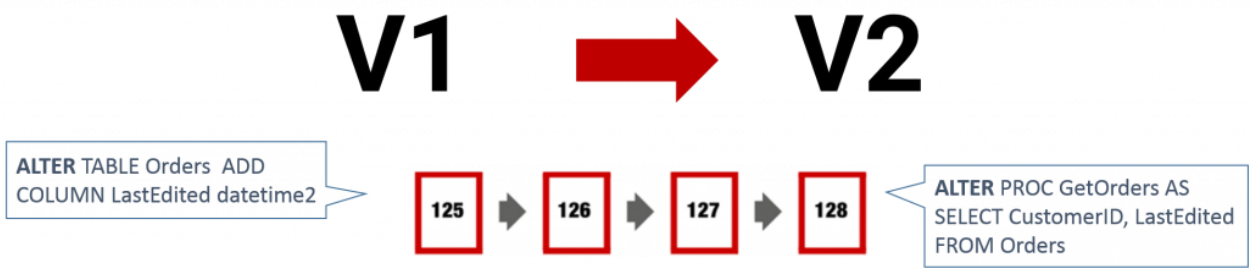

Figure 15: SQL Change Automation

SQL Source Control

This is a plug-in tool for the SSMS (SQL Server Management Studio). This tool stores current state of every database object as a CREATE manuscripts in source control (Siau& IGI Global, 2013). This tool also relates the set of CREATE texts to the database targeted and automatically creates a manuscript to coordinate both state by using SQL Compare tool.

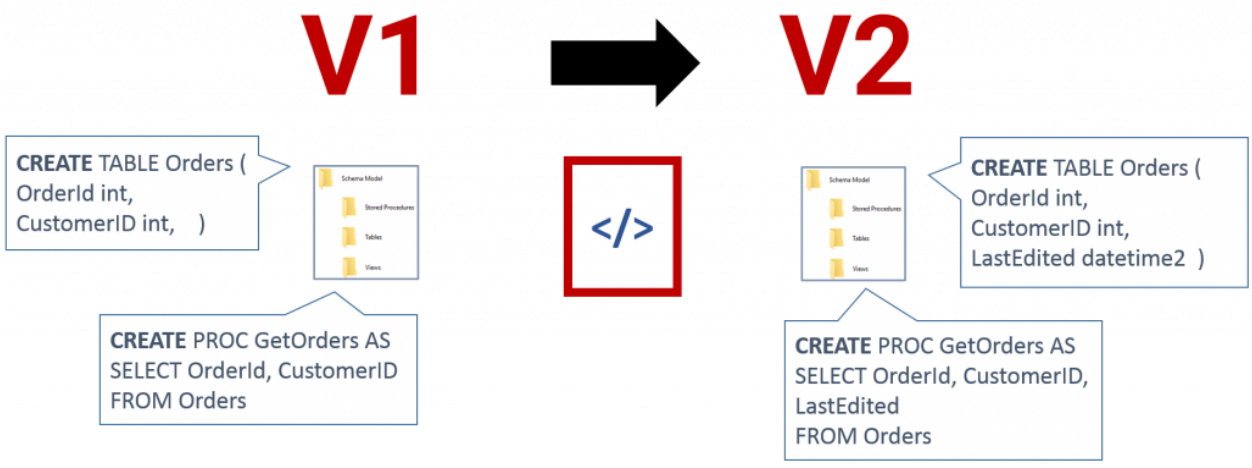

Fig 16: SQL Source Control

.NET Development

.NET is an all-purpose development platform. This can be used for all types of applications or used for workload where all-purpose systems are used(Murdoch, 2014). This platforms contains most of the fundamental

features which are eye-catching to the designers, for instance current programming languages and memory management. This platform can be useful when an organization wants to build appa of high quality. Several execution of .Net are accessible which are found on open.Net Standards which stipulate the significant of .NET platform.

Microsoft BI

This are set of tools that have been developed by Microsoft to simplify the processing of the data. The benefits of Microsoft BI is that it helps the organizations to seizure disorganized, multifaceted information into well-ordered. Microsoft BI is a well-known BI solution which is currently on the market(Powell, 2017). However, the complete assortment of these tools allows the organizations to pass/direct the data via information technology systems, classify and separate the data and generates extensive intelligences on the present status of diverse sections. These comprise of SQL Server Reporting Services, SQL Server Integration Services, and SQL Server Analytical Services. The notion here is that every volume of data can be seizure into spreadsheet, graph, dashboard and palatable report among other formats(Powell, 2017). The organization only have to input its constraints and allow the system to identify what the organization require. Moreover, Microsoft BI functions by moving the information or the data from different, uncontrollable sources to the server whereby data can be rearranged.

Fundamental Features of Power BI and the Reason Why an Organization Require them

Finding the Data

The significant purpose for Power BI is mining of data. This looks for information from various sources. This can be achieved by using two approaches; depend on Direct Query or import the data to Power BI (Powell, 2017). Importing the data you will be restricted to view information of 1 GB and you will be frustrated. When it comes to bigger reports Direct Query approach is the best.

Transmuting the Data

When you have find the correct source for the import, Power BI provides you with the performance/preview window to assist you in organizing the data (Powell, 2017). Query Editor enables you to figure, modify/change, organize, and rearrange the data in many ways.

Reporting and Publishing

After the mining of correct data and extraction of applicable discernments, now you can now draw-up convention reports (Powell, 2017). The best way of presenting information here are classic graphs, line graphs and pie charts. You can access the calculated columns by using DAX (Digital Analysis Expressions). Moreover, Power BI supports the use of third-party convention illustrations. However, you will be require to have a registered account in order for you to publish the reports once ready.

Generating Dashboards

Dashboards are helpful sharing functions. They enable the people to monitor people viewing and interacting with the published report. You can make the reports to be sticky to persist in detectable places. You are provided with an option to generate a live report feed in order for the docs and reports can be uploaded.

Sharing and Collaborating

Most of the time, Microsoft BI contains attractive vigorous safety structures. These features are bendable and customizable, therefore it is only a matter of organizing access level (Powell, 2017). Finally, an organization need the supervisors and managers to have self-determination in viewing and editing the reports. This is mostly the fundamental way of discovering the new methods of supply chain optimization.

Merchant/Vendor Challenges

Most of the vendors who are involved in implementation of BI lack enough skills for designing a BI data integration solution. Therefore the organization involved in BI implementation must look of the vendors who have knowledge on technology and understand the ways used in designing solution (Martinsuo, Korhonen, &Laine, 2014). To avoid these challenges, the organization should only make the payments after the BI solution has been executed successfully. This will make sure that the vendor involve has handle all the BI data integration defies that are surfaced during the execution process. Moreover, you should take account of the better-quality processes, for instance, ETL process (Extract-Transform-Loaded) (Sampson, 2015). In order to enhance data quality, ensure that your ETL processes happen on source level, and not on the target level. On the other side, the Load and Display processes can be accomplished on the target level. Furthermore, check volume and newness of the data should be frequently updated on real time basing on the requirements of the business (Martinsuo, Korhonen, &Laine, 2014). Finally, you should classify wholly the data points for the integration and you plan them out in advance before the commencement of the process.

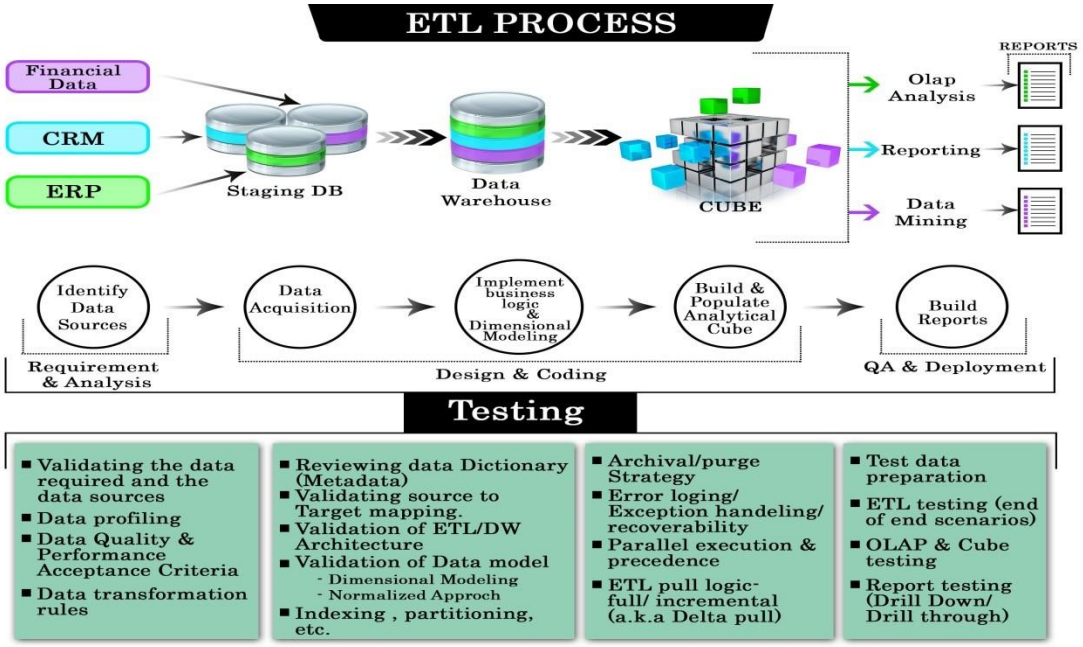

Fig 17: ETL Process

CONCLUSION

In conclusion, a fruitful execution and deployment of business intelligence systems needs some of the skills in project management as well as planning skills. Most of the skills that has been presented in this report comprises of project resource planning skills, quality management skills, cost management skills used for managing the costs that the organization can spend and finally time management skills. Furthermore, in order to accomplish the project successfully, the project needs a well-defined scope for management in order to enhance the simplicity of the project and avoid some of the issues that may arise during execution of the project or even widen the scope itself. On the other side project risk management is important in minimizing the chances and the extent that the risks can occur and preventing the risk from even occurring during the progress of the project. Data analyst also needs some of the skills for him or her to effectively use of BI system within an organization. Some of these skills that the data analyst requires comprise of; communication skills, data integration skills, technical skills and reporting skills that he or she can use to present certified/professional reports to the project managers that are generated by SAS to help them in making the final decision and after that they can deliver the reports to the project team. However, Microsoft has got

reputation for reliability and quality. A growing number of organizations are seeking for less important, new agile solutions. If an organization chooses to opt for the Microsoft BI, there is much to be known. The most vital thing is that you will need to create fun in performing so. Microsoft BI are versatile, fast moving and dynamic. Therefore, an organization need to utilize them accordingly and by doing so they will be of great value for the organization, reliable, and they will provide consistent information. Other tools which are most importance are the DevOPs. These help the organization to figure what the organization requires, provides early delivery, ensure healthier working interactions between the workers and produce the highest quality output, organization can detect error in time, and produce the outcomes which are reliable and comprehensible enabling the shareholders to incorporate corporate planning.

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