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META ANALYTICAL LITERATURE STUDY ON BUSINESS INTELLIGENCE AND ITS APPLICATIONS; A TECHNO-BUSINESS LEADERSHIP PERSPECTIVE

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Abstract: The earliest known use of the term "Business Intelligence" is in Richard Millar Devens' in the 'Cyclopædia of Commercial and Business Anecdotes' from 1865. Devens used the term to describe how the banker, Sir Henry Furnese, gained profit by receiving and acting upon information about his environment, prior to his competitors. "Throughout Holland, Flanders, France, and Germany, he maintained a complete and perfect train of business intelligence. The news of the many battles fought was thus received first by him, and thefall of Namur added to his profits, owing to his early receipt of the news." (Devens, (1865), p. 210). The ability to collect and react accordingly based on the information retrieved, an ability that Furnese excelled in, is today still at the very heart of BI. Business intelligence as it is understood today is said to have evolved from the decision support systems (DSS) that began in the 1960s and developed throughout the mid-1980s. DSS originated in the computer-aided models created

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to assist with decision making and planning. From DSS, data warehouses, Executive Information Systems, OLAPand business intelligence came into focus beginning in the late 80s.In 1989, Howard Dresner (later a Gartner analyst) proposed "business intelligence" as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based support systems." It was not until the late 1990s that this usage was widespread. Critics see BI as evolved from mere business reporting together with the advent of increasingly powerful and easy-to-use data analysis tools. In this respect it has also been criticized as a marketing buzzword in the context of the "big data" surge**.**

Keywords: Decision; Business Integration; Leadership; Intelligence; Executive Information; Support System.

Methodology: Literature Review & Meta analytical literature study

Data Used: Secondary Data, Analysis of Previous Studies and Literature Sources

Objectives: (i) To explore the latest developments in Business Intelligence Technology.

(ii) To Compare and relate with BI with Competitive Intelligence

(iii) To evaluate the marketplace Impact on using BI and to understand the problems with structured data

Review of Related Literature:

Pirttimäki (2007) depicts BI as a procedure that incorporates a series of activities, being driven by the particular data needs of decision makers and the objective of achieving competitive advantage. BI is a framework that transforms information into data and afterward into learning, consequently enhancing company's basic decision-making process **(Singh and Samalia, 2014).** BI is characterized as a framework which gathers, changes and shows organized information.

BI is termed to as a set of numerical and methodological models for examination utilized for extracting data and valuable information from raw information for utilizing confused basic leadership prepare **(Vercellis, 2013).**

Wixom and Watson (2010) mention that Business intelligence (BI) is a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to

help its users make better decisions.‖ We can upgrade the bits of knowledge gave by BI applications—particularly by utilizing information mining procedures, through simulation and modeling of real world under a "systems thinking" approach, enhancing forecasts, and adding to a superior comprehension of the business progression of any organization (Raisinghani, 2004).

BI helps administrators by breaking down information from various resources in better basic leadership at both tactical and strategic level, for customary utilization, conventional data frameworks farewell, yet for hierarchical and functional planning; new tools are required for business analysis **(Rasoul and Mohammad, 2016).**

Carlo (2009). BI is popular among companies mainly because of analysis of data that is of any form and formulate a strategy accordingly. Generally data is classified into three types—structured data, semi-structured data, and unstructured data. Structured data are information that is fixed form, the data may be a collection of forms of websites, and detailed address that can be easily read by the computers since the data is already standardized.

Carlo (2009) uses the following pyramid to describe how business intelligence system is constructed. Many researchers state that failure in adopting BI in an organization because of an absence of fit between organization's BI and its characteristics and objectives. An organization that has made progress with their BI usage have attempted to guarantee that their BI is steady with their corporate business targets and much research on BI achievement concentrates on the alignment amongst BI and business targets **(McMurchy, 2008).**

Oyku et al. (2012), BI can be examined from both organizational and technological views. Technological BI capabilities are referring to the data quality (data standard), technical platforms that could be integrated with other systems in the organization and user access. Organizational BI is the assets supporting the BI application that runs in the organization such as flexibility and shared risks and responsibilities (Ross, Beath and Goodhue, 1996).

Kimball et al. (2008) also stated that the data quality is the most important factor, and they added that the massive data from many different sources of a large enterprise can be integrated

into a coherent body to provide a clear view of its business, therefore, meaningful information can be delivered at the right time, in the right location, and in the right form to assist individuals, departments, divisions or even larger units to facilitate improved decision making. Data quality refers to the data which is consistent and comprehensive. Poor data reliability is because of poor data handling processes, poor data maintenance procedures, and errors in the migration process from one system to another. If the information that we collect is not accurately or consistently analyzed, organizations cannot satisfy their customers' expectations nor keep up with new information-centric regulations.

Oyku et al. (2012), in order to improve the business agility, the organization should develop the technological ability that could deliver accurate, consistent and timely information to its users. Moreover, clean and relevant data are one of the most essential factors of BI success. As companies incorporate data from a wider variety of sources, they will continue to face new and ever-increasing issues surrounding the quality of the data on which they rely.

Oyku et al. (2012) have different capabilities and serve different purposes so that one size does not fit with all BI. Whether the organization prefers to use a single BI suite or best-of-breed applications, it is essential to match tool capabilities with user types. While some organizations limit user access through practicing authorization/authentication and access control, others prefer to allow full access to all types of users through a web-centric approach. It is critical that organizations achieve the necessary balance to allow the way BI users access information to fit the types of decisions they make using BI.

Alaskar and Efthimios (2015), not all of BI solutions succeed in all organizations, and, there are signs, before a project begins, that could indicate whether the project will succeed, struggle, or fail and it is essential that organizations are aware of the key indicators of success in adopting BI, so as to overcome the challenges or risks that are associated with the BI project during its implementation.

Introduction: Business intelligence: Business intelligence is designed to support the process of decision-making" (Arnott,Gibson, & Jagielska, 2004, p. 296). Arnott et al. (2004) define the role

of business intelligence"to extract the information deemed central to the business, and to present or manipulate that data into information that is useful for managerial decision support" (p. 296). Negash (2004) notesthat business intelligence is "used to understand the capabilities available in the firm; the state of the art, trends, and future directions in the markets, the technologies, and the regulatory environment in which the firm competes; and the actions of competitors and the implications of these actions".

Business intelligence systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers, in order to improve the timeliness and quality of the decision-making process (Negash, 2004). Business Intelligence (BI) comprises the set of strategies, processes, applications, data, technologies and technical architectures which are used by enterprises to support the collection, data analysis, presentation and dissemination of business information. BI technologies provide historical, current and predictive views of business operations. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics. BI technologies can handle large amounts of structured and sometimes unstructured data to help identify, develop and otherwise create new strategic business opportunities. They aim to allow for the easy interpretation of these big data. Identifying new opportunities and implementing an effective strategy based on insights can provide businesses with a competitive market advantage and long-term stability. Business intelligence can be used by enterprises to support a wide range of business decisions - ranging from operational to strategic. Basic operating decisions include product positioning or pricing. Strategic business decisions involve priorities, goals and directions at the broadest level. In all cases, BI is most effective when it combines data derived from the market in which a company operates (external data) with data from company sources internal to the business such as financial and operations data (internal data). When combined, external and internal data can provide a more complete picture which, in effect, creates an "intelligence" that cannot be derived by any singular set of data. Amongst myriad uses, business intelligence tools empower organizations to gain insight into new markets, to assess demand and suitability of products and services for different market segments and to gauge the impact of marketing

efforts. Often[BI applications use data gathered from a data warehouse (DW) or from a data mart, and the concepts of BI and DW combine as "BI/DW" or as "BIDW". A data warehouse contains a copy of analytical data that facilitates decision support.

A business intelligence system is a set of tools, technologies and programmed products that are used to collect, integrate, aggregate and make data available (Koronios &Yeoh, 2009). Business intelligence systems provide actionable information delivered at the right time (Negash, 2004) when decisions need to be made. The beginning point of this study is to identify the key components that are common to all business intelligence systems. Business intelligence systems, as the term is typically used, is often confused with a specific "off the shelf" piece of hardware and with a software solution that businesses can simply purchase, turn on and utilize to create business intelligence to facilitate the decision-making process; but business intelligence systems is really just an umbrella term (Levinson, 2006). Techniques that can consist of dozens of hardware solutions with expensive software at one end of the spectrum and as little as one server with specialized software on the other end. While business needs dictate the necessity for different components and complexity for a business intelligence system, all business intelligence systems require, at a minimum, four specific components to produce business intelligence. These components are described throughout the larger literature to the degree that they are now taken-for-granted and they include (a) data warehouses, (b) ETL tools, (c) OLAP techniques and (d) data mining (Olszak & Ziemba, 2006). Business intelligence system components are used to support a set of managerial decision-making actions (Cella, Golfarelli & Rizzi, 2004). Actions are described as: (a) acquire(e.g. supported by the data warehousing component), (b) gather (e.g. supported by the extracttransform-load component), (c) analyze (e.g., supported by the use of on-line analytical products) and (d) report (e.g., supported by the data-mining component) data that come from different and dispersed sources (Olszak & Ziemba, 2007). The purpose of this study is framed in two stages. Stage One involves identification and description of aspects of each of the four most common components of a BI system. Once aspects are identified and described, they are aligned with the relevant managerial decision-making action of (a) acquiring, (b) searching/gathering, (c) analyzing, and (d) delivery of information. The goal of the study is to propose ways to better facilitate the managerial decision-making process. Components: Business intelligence is made up of an increasing number of components including: Multidimensional

aggregation and allocation, Denormalization, tagging and standardization, Realtime reporting with analytical alert.A method of interfacing, with unstructured data sources, Group consolidation, budgeting and rolling forecasts, Statistical inference and probabilistic simulation, Key performance indicators optimization, Version control and process management, Open item management. **BI Portals**; A Business Intelligence portal (BI portal) is the primary access interface for Data Warehouse (DW) and Business Intelligence (BI) applications. The BI portal is the user's first impression of the DW/BI system. It is typically a browser application, from which the user has access to all the individual services of the DW/BI system, reports and other analytical functionality. The BI portal must be implemented in such a way that it is easy for the users of the DW/BI application to call on the functionality of the application.The BI portal's main functionality is to provide a navigation system of the DW/BI application. This means that the portal has to be implemented in a way that the user has access to all the functions of the DW/BI application.The most common way to design the portal is to custom fit it to the business processes of the organization for which the DW/BI application is designed, in that way the portal can best fit the needs and requirements of its users. The BI portal needs to be easy to use and understand, and if possible have a look and feel similar to other applications or web content of the organization the DW/BI application is designed for (consistency).

Objective; (i) To explore the latest developments in Business Intelligence Technology.

Data warehousing; To distinguish between the concepts of business intelligence and data warehouses, Forrester Research defines business intelligence in one of two ways:Using a broad definition: "Business Intelligence is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making." Under this definition, business intelligence also includes technologies such as data integration, data quality, data warehousing, master-data management, text- and content-analytics, and many others that the market sometimes lumps into the "Information Management" segment. Therefore, Forrester refers to *data preparation* and *data usage* as two separate but closely linked segments of the business-intelligence architectural stack.Forrester defines the narrower business-intelligence market as, "...referring to just the top layers of the BI architectural stack such as reporting, analytics anddashboards."

Applications in an enterprise

Business intelligence can be applied to the following business purposes, in order to drive business value.

1. Measurement – program that creates a hierarchy of performance metrics (see also Metrics Reference Model) and benchmarking that informs business leaders about progress towards business goals (business process management).
2. Analytics – program that builds quantitative processes for a business to arrive at optimal decisions and to perform business knowledge discovery. Frequently involves:data mining, process mining, statistical analysis, predictive analytics, predictive modeling, business process modeling, data lineage, complex event processing andprescriptive analytics.
3. Reporting/enterprise reporting – program that builds infrastructure for strategic reporting to serve the strategic management of a business, not operational reporting. Frequently involves data visualization, executive information system and OLAP.
4. Collaboration/collaboration platform – program that gets different areas (both inside and outside the business) to work together through data sharing and electronic data interchange.
5. Knowledge management – program to make the company data-driven through strategies and practices to identify, create, represent, distribute, and enable adoption of insights and experiences that are true business knowledge. Knowledge management leads to learning management and regulatory compliance.

In addition to the above, business intelligence can provide a pro-active approach, such as alert functionality that immediately notifies the end-user if certain conditions are met. For example, if some business metric exceeds a pre-defined threshold, the metric will be highlighted in standard reports, and the business analyst may be alerted via e-mail or another monitoring service. This end-to-end process requires data governance, which should be handled by the expert.[*citation needed*]

Prioritization of projects

It can be difficult to provide a positive business case for business intelligence initiatives, and often the projects must be prioritized through strategic initiatives. BI projects can attain higher prioritization within the organization if managers consider the following:

- As described by Kimball[17] the BI manager must determine the tangible benefits such as eliminated cost of producing legacy reports.

- Data access for the entire organization must be enforced.[18] In this way even a small benefit, such as a few minutes saved, makes a difference when multiplied by the number of employees in the entire organization.
- As described by Ross, Weil & Roberson for Enterprise Architecture,[19] managers should also consider letting the BI project be driven by other business initiatives with excellent business cases. To support this approach, the organization must have enterprise architects who can identify suitable business projects.
- Using a structured and quantitative methodology to create defensible prioritization in line with the actual needs of the organization, such as a weighted decision matrix.[20]

Success factors of implementation

According to Kimball et al., there are three critical areas that organizations should assess before getting ready to do a BI project:[21]

1. The level of commitment and sponsorship of the project from senior management.
2. The level of business need for creating a BI implementation.
3. The amount and quality of business data available.

Business sponsorship; The commitment and sponsorship of senior management is according to Kimball *et al.*, the most important criteria for assessment.[22] This is because having strong management backing helps overcome shortcomings elsewhere in the project. However, as Kimball *et al.* state: "even the most elegantly designed DW/BI system cannot overcome a lack of business [management] sponsorship". It is important that personnel who participate in the project have a vision and an idea of the benefits and drawbacks of implementing a BI system. The best business sponsor should have organizational clout and should be well connected within the organization. It is ideal that the business sponsor is demanding but also able to be realistic and supportive if the implementation runs into delays or drawbacks. The management sponsor also needs to be able to assume accountability and to take responsibility for failures and setbacks on the project. Support from multiple members of the management ensures the project does not fail if one person leaves the steering group. However, having many managers work together on the project can also mean that there are several different interests that attempt to pull the project in different directions, such as if different departments want to put more emphasis on their usage.

This issue can be countered by an early and specific analysis of the business areas that benefit the most from the implementation. All stakeholders in the project should participate in this analysis in order for them to feel invested in the project and to find common ground.Another management problem that may be encountered before the start of an implementation is an overly aggressive business sponsor. Problems of scope creep occur when the sponsor requests data sets that were not specified in the original planning phase. **Business needs**; Because of the close relationship with senior management, another critical thing that must be assessed before the project begins is whether or not there is a business need and whether there is a clear business benefit by doing the implementation.[24] The needs and benefits of the implementation are sometimes driven by competition and the need to gain an advantage in the market. Another reason for a business-driven approach to implementation of BI is the acquisition of other organizations that enlarge the original organization it can sometimes be beneficial to implement DW or BI in order to create more oversight.Companies that implement BI are often large, multinational organizations with diverse subsidiaries.[25] They may go through the implementation of a Business Intelligence Competency Center (BICC).A well-designed BI solution provides a consolidated view of key business data not available anywhere else in the organization, giving management visibility and control over measures that otherwise would not exist. **Amount and quality of available data**; Without proper data, or with too little quality data, any BI implementation fails; it does not matter how good the management sponsorship or business-driven motivation is. Before implementation it is a good idea to do data profiling. This analysis identifies the "content, consistency and structure [..]"[24] of the data. This should be done as early as possible in the process and if the analysis shows that data is lacking, put the project on hold temporarily while the IT department figures out how to properly collect data.When planning for business data and business intelligence requirements, it is always advisable to consider specific scenarios that apply to a particular organization, and then select the business intelligence features best suited for the scenario.Often, scenarios revolve around distinct business processes, each built on one or more data sources. These sources are used by features that present that data as information to knowledge workers, who subsequently act on that information. The business needs of the organization for each business process adopted correspond to the essential steps of business intelligence. These essential steps of business intelligence include but are not limited to:

1. Go through business data sources in order to collect needed data

2. Convert business data to information and present appropriately
3. Query and analyze data
4. Act on the collected data

Objective: (ii) To Compare and relate with BI with Competitive Intelligence;

Comparison with competitive intelligence; Though the term business intelligence is sometimes a synonym for competitive intelligence (because they both support decision making), BI uses technologies, processes, and applications to analyze mostly internal, structured data and business processes while competitive intelligence gathers, analyzes and disseminates information with a topical focus on company competitors. If understood broadly, business intelligence can include the subset of competitive intelligence. Comparison with business analytics; Business intelligence and business analytics are sometimes used interchangeably, but there are alternate definitions. One definition contrasts the two, stating that the term business intelligence refers to collecting business data to find information primarily through asking questions, reporting, and online analytical processes. Business analytics, on the other hand, uses statistical and quantitative tools for explanatory and predictive modelling.In an alternate definition, Thomas Davenport, professor of information technology and management at Babson College argues that business intelligence should be divided intoquerying, reporting, Online analytical processing (OLAP), an "alerts" tool, and business analytics. In this definition, business analytics is the subset of BI focusing on statistics, prediction, and optimization, rather than the reporting functionality. The quality aspect in business intelligence should cover all the process from the source data to the final reporting. At each step, the quality gates are different:

1. Source Data:
- Data Standardization: make data comparable (same unit, same pattern...)
- Master Data Management: unique referential

2. Operational Data Store (ODS):
- Data Cleansing: detect & correct inaccurate data
- Data Profiling: check inappropriate value, null/empty

3. Data warehouse:
- Completeness: check that all expected data are loaded
- Referential integrity: unique and existing referential over all sources

- Consistency between sources: check consolidated data vs sources

4. Reporting:

- Uniqueness of indicators: only one share dictionary of indicators
- Formula accuracy: local reporting formula should be avoided or checked

User aspect

Some considerations must be made in order to successfully integrate the usage of business intelligence systems in a company. Ultimately the BI system must be accepted and utilized by the users in order for it to add value to the organization. If the usability of the system is poor, the users may become frustrated and spend a considerable amount of time figuring out how to use the system or may not be able to be productive. If the system does not add value to the users´ mission, they simply don't use it. To increase user acceptance of a BI system, it can be advisable to consult business users at an early stage of the DW/BI lifecycle, for example at the requirements gathering phase. This can provide an insight into the business process and what the users need from the BI system. There are several methods for gathering this information, such as questionnaires and interview sessions.When gathering the requirements from the business users, the local IT department should also be consulted in order to determine to which degree it is possible to fulfill the business's needs based on the available data. Taking a user-centered approach throughout the design and development stage may further increase the chance of rapid user adoption of the BI system. Besides focusing on the user experience offered by the BI applications, it may also possibly motivate the users to utilize the system by adding an element of competition. Kimball suggests implementing a function on the Business Intelligence portal website where reports on system usage can be found. By doing so, managers can see how well their departments are doing and compare themselves to others and this may spur them to encourage their staff to utilize the BI system even more.In a 2007 article, H. J. Watson gives an example of how the competitive element can act as an incentive.[28] Watson describes how a large call centre implemented performance dashboards for all call agents, with monthly incentive bonuses tied to performance metrics. Also, agents could compare their performance to other team members. The implementation of this type of performance measurement and competition significantly improved agent performance.BI chances of success can be improved by involving senior management to help make BI a part of the organizational culture, and by providing the

users with necessary tools, training, and support. Training encourages more people to use the BI application. Providing user support is necessary to maintain the BI system and resolve user problems. User support can be incorporated in many ways, for example by creating a website. The website should contain great content and tools for finding the necessary information. Furthermore, helpdesk support can be used. The help desk can be manned by power users or the DW/BI project team.

Objective; (iii); To evaluate the marketplace Impact on using BI and understand the problems with structured data

Marketplace; There are a number of business intelligence vendors, often categorized into the remaining independent "pure-play" vendors and consolidated "megavendors" that have entered the market through a recent trend of acquisitions in the BI industry. The business intelligence market is gradually growing. In 2012 business intelligence services brought in $13.1 billion in revenue. Some companies adopting BI software decide to pick and choose from different product offerings (best-of-breed) rather than purchase one comprehensive integrated solution (full-service). Specific considerations for business intelligence systems have to be taken in some sectors such as governmental banking regulations or healthcare. The information collected by banking institutions and analyzed with BI software must be protected from some groups or individuals, while being fully available to other groups or individuals. Therefore, BI solutions must be sensitive to those needs and be flexible enough to adapt to new regulations and changes to existing law. **Semi-structured or unstructured data**; Businesses create a huge amount of valuable information in the form of e-mails, memos, notes from call-centers, news, user groups, chats, reports, web-pages, presentations, image-files, video-files, and marketing material and news. According to Merrill Lynch, more than 85% of all business information exists in these forms. These information types are called either *semi-structured* or *unstructured* data. However, organizations often only use these documents once. The managements of semi-structured data is recognized as a major unsolved problem in the information technology industry.[37] According to projections from Gartner (2003), white collar workers spend anywhere from 30 to 40 percent of their time searching, finding and assessing unstructured data. BI uses both structured and unstructured data, but the former is easy to search, and the latter contains a large quantity of the information needed for analysis and decision making. Because of the difficulty of properly

searching, finding and assessing unstructured or semi-structured data, organizations may not draw upon these vast reservoirs of information, which could influence a particular decision, task or project. This can ultimately lead to poorly informed decision making. Therefore, when designing a business intelligence/DW-solution, the specific problems associated with semi-structured and unstructured data must be accommodated for as well as those for the structured data. **Unstructured data vs. semi-structured data**; Unstructured and semi-structured data have different meanings depending on their context. In the context of relational database systems, unstructured data cannot be stored in predictably ordered columns and rows. One type of unstructured data is typically stored in a BLOB (binary large object), a catch-all data type available in most relational data base management systems. Unstructured data may also refer to irregularly or randomly repeated column patterns that vary from row to row within each file or document. Many of these data types, however, like e-mails, word processing text files, PPTs, image-files, and video-files conform to a standard that offers the possibility of metadata. Metadata can include information such as author and time of creation, and this can be stored in a relational database. Therefore, it may be more accurate to talk about this as semi-structured documents or data, but no specific consensus seems to have been reached. Unstructured data can also simply be the knowledge that business users have about future business trends. Business forecasting naturally aligns with the BI system because business users think of their business in aggregate terms. Capturing the business knowledge that may only exist in the minds of business users provides some of the most important data points for a complete BI solution. **Problems with semi-structured or unstructured data;** There are several challenges to developing BI with semi-structured data. According to Inmon & Nesavich, some of those are: Physically accessing unstructured textual data – unstructured data is stored in a huge variety of formats. Terminology – Among researchers and analysts, there is a need to develop a standardized terminology. Volume of data – As stated earlier, up to 85% of all data exists as semi-structured data. Couple that with the need for word-to-word and semantic analysis. Search ability of unstructured textual data – A simple search on some data, e.g. apple, results in links where there is a reference to that precise search term. (Inmon & Nesavich, 2008) gives an example: “a search is made on the term felony. In a simple search, the term felony is used, and everywhere there is a reference to felony, a hit to an unstructured document is made. But a simple search is crude. It does not find references to crime, arson, murder, embezzlement, vehicular homicide, and such,

even though these crimes are types of felonies."The use of metadata; to solve problems with search ability and assessment of data, it is necessary to know something about the content. This can be done by adding context through the use of metadata. Many systems already capture some metadata (e.g. filename, author, size, etc.), but more useful would be metadata about the actual content – e.g. summaries, topics, people or companies mentioned. Two technologies designed for generating metadata about content are automatic categorization and information extraction.

Findings and Conclusion:

Other business intelligence trends include the following: Third party SOA-BI products increasingly address ETL issues of volume and throughput. Companies embrace in-memory processing, 64-bit processing, and pre-packaged analytic BI applications. Operational applications have callable BI components, with improvements in response time, scaling, and concurrency. Near or real time BI analytics is a baseline expectation. Open source BI software replaces vendor offerings. Other lines of research include the combined study of business intelligence and uncertain data. In this context, the data used is not assumed to be precise, accurate and complete. Instead, data is considered uncertain and therefore this uncertainty is propagated to the results produced by BI. According to a study by the Aberdeen Group, there has been increasing interest in Software-as-a-Service (SaaS) business intelligence over the past years, with twice as many organizations using this deployment approach as one year ago – 15% in 2009 compared to 7% in 2008. An article by InfoWorld's Chris Kanaracus points out similar growth data from research firm IDC, which predicts the SaaS BI market will grow 22 percent each year through 2013 thanks to increased product sophistication, strained IT budgets, and other factors.[46]An analysis of top 100 Business Intelligence and Analytics scores and ranks the firms based on several open variables. Conclusion; Computing within less cost has always been a concern for IT development. Grid and Distributed computing offers high performance by using the concept of dividing and allotting large processes to different systems. The IT sector has always been in search for that computing model, which could provide availability to computing resources from anywhere, anytime with its infinite resources within less time and less cost. Cloud computing is one of them. Utility computing (Cloud computing) uses the theory of "*pay as you go"* and reduces the processing cost. This virtualization technology presents various independent virtual systems to from one physical system. But the performance of cloud

computing has become a serious problem. Cloud computing is the rescue of computing services over the Internet. Cloud services authorize individuals and businesses to use software and hardware that are managed by third parties at remote locations. Cloud computing realizes computing as a utility. It provides a pool of resources which can be allocated to users dynamically according to their requirement. Thus both the users and providers are benefited: providers can reuse their resources and users acquire and release resources according to their requirement. The cloud provide on demand self-service in which user can provision the resource whenever required without human interaction. Computing facilities are available over the internet which can be easily accessed by the devices like mobile phones, laptops, PDAs anywhere and at any time. Business Intelligence is a highly resource intensive application which requires large scale parallel processing and huge storage capacities in data warehouse. The data warehouses are regularly updated at frequent intervals through appropriate queries executed on the business processing and transactional databases. In future a difficulty might arise for companies to keep on adding resources to data warehouses. Cloud computing has instigated a new hope for future prospects of Business Intelligence. The objective of Business intelligence is to improve the timeliness and quality of information, and facilitate managers to be able to better understand the position of their firm as in comparison to competitors. Business intelligence plays an important role extracting valuable information and discovering the hidden patterns in internal as well as external sources of data. However majority of organizational knowledge is in unstructured form or in the minds of its employees. Business Intelligence delivers the appropriate data at the proper time and in the meticulous arrangement. It offers user-friendly information openly to users where they can work, team up, and make resolutions.

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