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Scope of Business Intelligence in Organizations

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Abstract - *Business Intelligence (BI) is a broad category of applications which consists of applications used for gathering, storing and analyzing the stored data, and providing access to data to help enterprise users make informed business decisions. With a huge amount of data being generated on a regular basis, organizations need some application to filter through the enormous data and provide them with the required data. BI helps the end user in making better decisions with regards to business by providing them with a system based on facts. This paper describes the scope of business intelligence in organizations.*

Key Words: Business Intelligence, end-user, decision-making, organizations, Big Data.

1. INTRODUCTION

Rapid advancements in technology has led to rise in the generation of huge amounts of data on a regular basis and if any individual were to sift through all this data, he or she would find it difficult to obtain the required data on an accurate scale. Hence, in this era of big data, business intelligence paves the way in obtaining the required data by helping the individual in correctly analyzing the data and deriving the results. Business intelligence provides a strategic roadmap for any organization by helping them truly understand their client's business requirements with the help of data mining and statistics.

This paper proposes the scope of business intelligence in organizations and where it can be applicable. Organizations deal with a large amount of data and for the systems to function with the enormous amount of data, they use systems which combine front-end capabilities with Extraction, Transform and Load (ETL) techniques to extract the huge amount of data. At the middle of all this, are vast enterprise data warehouses which help in populating the dashboards, Online Analytical Processing (OLAP) cubes and datasets. An effective business intelligence solution should clearly account for the goal-oriented behavior of the decision-maker.

1.1. Business Intelligence definition

BI can be understood as a philosophy, which includes a wide array of strategies, data, products and technical architectures used to support the analysis and dissemination of business data [1]. Business intelligence can also be defined as a group of processes, models and technologies that convert raw or crude information into important data that drives important business actions. BI has a direct impact on an organization's business decisions. It supports fact-based decision systems. BI tools perform analysis of data and create dashboards on the analysed data which help the end-user in making informed decisions.

1.2. Trends in Business Intelligence

With the increase in the data generation worldwide, many data-centric organizations have come forward to utilize BI tools. In the era of big data, BI tools have proved to be a boon to data analysts. BI has been employed in most of the major industries to help make sense of the data being generated. Data quality is a major issue for most analysts and BI tools is being used to measure the accuracy of the data. BI is coming up in a big way in sales and marketing sector, where BI tools are helping the decision-makers in making informed business decisions in deploying their product. It is also being used a lot in predictive analysis and reporting, where the future trends of the business can be calculated from the current data patterns. Although business analytics is a small part of the workflow of an organization, it is becoming increasingly important for the management in helping in dealing with modern complexities and is being adopted in majority of the organizations.

1.3. Need for BI in organizations

Business intelligence has become more than a tool that is just used to analyse the past behaviour of an isolated business activity. Many organisations have made it a high-priority technology to invest in. The role of BI is becoming increasingly important and is changing the way information is being gathered and analysed. Thus, organizations can lead and enhance performance to achieve greater efficiency and economic benefits. In [2], it is mentioned that end-user satisfaction is of prime importance, which is achieved only with the help of BI systems, which is useful in generating deep insights about customer trends and helps in delivering a better product more suited to customer requirements. Business intelligence is slowly becoming the key to better manage the performance of a multi-faceted organization and its various business operations. Some of the other benefits are that, BI leads to faster and effective decision-making,

provides a detailed insight into the client's requirements and helps in the growth and identification of new business opportunities.

2. ARCHITECTURE of BI

A typical BI system is designed to support fact -based decision-making. It combines data warehousing, ETL tools and user interface. A typical BI architecture is depicted in figure 1.

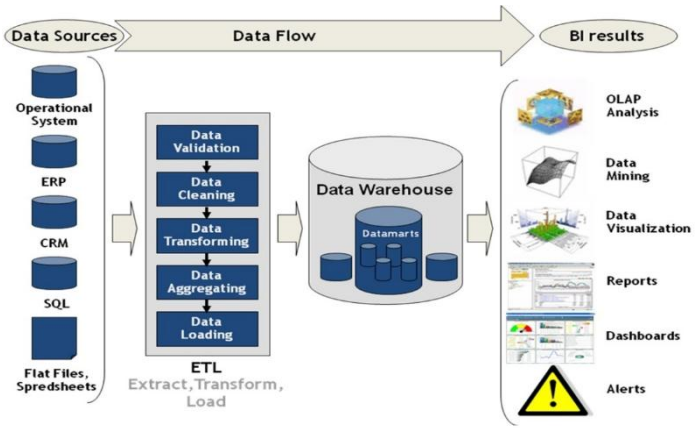

Fig. 1: Architecture of a typical BI System [3]

As shown in figure 1, the BI system obtains data for its dataset from multiple data sources, which are then converted into a multidimensional form by ETL tools [4]. Extraction, Transformation and Loading (ETL) tools validate, clean, transform and load the data in the right format into a data store which is optimized for decision support. A data store is usually represented by data warehouses or data marts. It contains data extracted from operational databases as well as from external sources. OLTP forms the bulk of the data present in the data store, which deals with daily transaction of data [5]. The data gathered from external sources is information not found within the organization but is crucial to the decision-making process.

The data store also contains business model data, which is data modelled to identify the key problems in the business environment of an organization. This will help in minimizing the cost of replication of storage and helps in the organization of data. The data present in the data store is retrieved with the help of OLAP tools. The data analyst creates queries to access the database and in turn helps in the retrieval, analysis and mining of the data present in the data store. The OLAP tool helps in building an efficient business solution. The data taken from the data store, has to be visualized using data visualization tools. This will help the end-user in understanding the workflow of the business and helps them make informed decisions, in order to enhance the growth of the business.

3. MARKET OVERVIEW

The BI Market was valued at USD 20.516 billion in 2019 and it will go on to reach USD 40.50 billion by 2025, at a compound annual growth rate of 12% over the period of 2020-2025 [6]. The market share of BI has steadily increased over the years, with the advent of big data and the growing need by organizations to make critical business decisions within a small span of time, in order to gain a competitive edge over their rivals. This trend is bound to increase in time owing to the increase in investments and the advancement of technology.

A major driving factor for BI in the market, is that it can substantially improve financial performance, maximize the utilization of resources and minimize the risk factor of each decision being taken. It also enhances the end-user's experience by providing them with visualization of the data on a dashboard, performance metrics and so on. Another driving factor is the integration of advanced analytics for big data with BI systems, leading to the end-user gaining an in-depth knowledge with an exploratory perspective of the data. According to MicroStrategy, 52% of the organizations across the globe used predictive analysis to gain a greater insight into the organization's business operations [6].

The emergence of IoT and big data has led to the rise in the growth of the unstructured data market. This has led organizations to adopt technologies which help in predictive analysis of the data. With the number of organizations using cloud services on the rise, cloud BI applications are becoming increasingly popular. These BI applications include the monitoring of key performance indicator (KPI), and interactive dashboard publishing. It provides a cost-effective solution to organizations as the entire business data catalogue can be accessed easily and from anywhere, owing to its online nature, which allows end-users to generate insights on the go. The Market can be segmented by the type of BI as following:

- Mobile BI: which refers to the current trend of users accessing business information on their phones leading to information being consumed anywhere.
- Cloud BI: which refers to cloud applications providing a single outlet for BI uses as well.
- Social BI: which helps to serve self-analysis of the data by the end-users rather than depend on IT staff. In other words, it's a self-service BI.
- Traditional BI: which is the orthodox method of Business Intelligence where the data is pre-defined, and the user can only interact with the system though dashboards and reports.

4. APPLICATIONS OF BI

With the advent of new technology, there has been rapid modernization, which has led to the increase in the generation of data on a large scale. Many companies are now implementing BI systems to help them in various sectors of the business.

4.1. Trade Intelligence

One of the key factors of BI is that it creates a middle ground between the business and the customer. It helps in pitching the product to potential clients in a smoother and more predictable manner. BI helps in collecting data based on very specific KPI's like sales metrics which help in understanding the customer and their requirement in a better fashion. Given the competitive nature of the modern era, sales opportunities have to be converted as soon as possible and BI helps in maximising the sales operations by identifying trends in customer preferences.

4.2. Visualisation

With the exponential growth of big data, which is huge in volume, it is becoming increasingly difficult to gleam hidden information because of the unavailability of scalable visualisation tools [7]. BI offers a range of tools which help in analysing and managing data related to an organization. The data, which is represented in the form of visualizations, help the management in monitoring the data. By representing the data in a visual format, even non-technical users can easily gleam information from the dashboard, which is helpful in the cognitive processing of information.

4.3. Reporting

Helps in conveying the information at a glance. It is one of the crucial applications which helps in the orderly organization of data into a single dashboard which helps in monitoring business performance. It helps provide some level of agility in data analysis by providing real time predictive analysis, making the dashboards interactive.

4.4. Monitoring performance efficiency

The goals set by an organization can be monitored based on pre-defined deadlines, using BI applications. The BI application can analyse historical data and come up with a new deadline by which the goals can be met. This helps in making the management more goal oriented.

4.5. Multi-Dimensional Analysis

BI applications help in the slicing and dicing of data, leading to analysis of data at a granular level. This offers a deeper insight into the data being stored in a data warehouse.

Table 1 describes the common ways by which BI is implemented in organizations across the globe. It gives a general overview of the techniques currently being used to implement BI.

Table 1 Common Techniques used to implement BI

Technique	Description
Analytics	Involves deriving of meaningful information from existing data to extract meaningful insights.
Predictive Modelling	It involves the use of multiple statistical models that is used to forecast probabilities of possible future events that might occur.
Exploratory Data Analysis	Deals with the exploration of data to identify patterns which will help in creating a business model.
Online Analytical Processing	It is used to dissect and analyse data which is multi-dimensional in nature.
Data Mining	It is used for discovering recurring trends which will lead to discovering patterns in customer trends.
Visualisation	Used to transform the data into graph-like structures which can be easily imbibed by the end-user.

5. FUTURE SCOPE

Organizations across the globe have adopted business intelligence systems to help in analyzing the huge amount of data being generated on a regular basis. Though there are several factors, which help in making BI a huge success, most of its success can be attributed to the fact, that it tries to conform to a single version of truth, making the data more reliable in nature. With rapid advancements in technology, the existing technology is getting outdated, which is the not the case with BI applications. BI systems can automatically update itself without any human interaction, such that it will stay relevant for a long time to come. Also, as dependence on data grows day by day, almost any use of data would require the help of BI applications to extract valuable insights in the future. BI applications conduct faster analysis and perform

dissection of the data at a faster rate helping the organization make business decisions at a fraction of the cost, earlier analytical tools were working on and will thereby be a valuable addition to the technology stack of any organization.

6. CONCLUSION

In the modern-day business environment, when the sustainability of the competitive advantage is a moving target, the need for rational decision-making is increasing leaving lesser room for intuition [8]. In the era of big data, there is a need of employing high-performance and highly scalable systems to deal with the enormous datasets. Business intelligence systems are completely necessary for any organization to remain ahead of their rivals. By not implementing BI systems, the company remains handicapped and will lose out on huge business opportunities and future investments. This paper gives the current scope of business intelligence in organizations and tries to shed light on the importance of BI systems in the business operations of an organization.

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