

Benefits to Business Intelligence using Data Mining Techniques

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Abstract - Business Intelligence (BI) is a concept of applying a set of technologies to convert data into meaningful information. BI methods include information retrieval, data mining, statistical analysis as well as data visualization. A wide range of marketing companies requires the analysis of millions of shopping transaction records daily such as sales revenue by products to guide personalized marketing, promotional campaigns, costs and incomes and provide historical, current and predictive views of Business operations. Large amounts of data originating in different formats and from different sources can be consolidated and converted to key business knowledge. Data mining is used to search for patterns and correlations within a database of information. Business intelligence (BI) focuses on detail integration and organization.

Key Words: Data mining techniques, Business operations, Business intelligence, Supply chain management, Customer relationship management.

1. INTRODUCTION

Using technology to gain an edge in business is not a new idea. Whenever there is something new, entrepreneurs will be quick to try to find an application for it in the business world to make money. Data mining (DM) and business intelligence (BI) are among the information technology applications that have business value. This paper will first outline what data mining and business intelligence are, then move on to practical usages in various business contexts. It will then proceed to a section dealing with how C-Suite executives, like the CFO, CIO, etc., will handle the choice of whether to implement a system and how to go about doing it. Suggestions as to which industries are best suited for this technology are also given. Finally, there is a section on how DM and BI will affect the accounting profession. Data mining is the process of searching through data using various algorithms to discover patterns and correlations within a database of information. Business intelligence, on the other hand, focuses more on data integration and organization. It will combine data analyse to help managers make operational, tactical, or strategic business decisions.

A data mining technique gives useful information from various database sources and provides information into useful patterns. The development of information technology has generated large amounts of data from various databases, data warehouses and other repository

information. The research operations on databases give the approach for future use store and process information to make better business results. For these applications this form of manual examine of data set is slow, expensive, and highly subjective. In fact, as data volumes grow dramatically. The need to scale up human analysis capabilities to handling the large number of bytes that we can collect is both economic and scientific. Businesses use data to gain competitive advantage, increase efficiency, and provide more valuable services to customers. Data we capture about our environment are the basic evidence we use to build theories and models of the universe we live in. Hence, Knowledge discovery Techniques is an attempt to address a problem that the digital information era made a fact of life for all of us. Data mining tools allows users to analyze large database to solve business decision making problems. This evolution began when business data was first stored on computers, continued with improvements in data access and more advanced technologies that allow users to navigate through their data in real time.

It is expert information, knowledge and technologies efficient in the management of organizational and individual business. Therefore, in this sense, business intelligence is a broad category of applications and technologies for gathering, providing access to, and analyzing data for the purpose of helping enterprise users make better business decisions. The term implies having a comprehensive knowledge of all of the factors that affect the business. It is imperative that firms have an in depth knowledge about factors such as the customers, competitors, business partners, economic environment, and internal operations to make effective and good quality business decisions. Business intelligence enables firms to make these kinds of decisions. The paper explores the concepts of BI, its components, emergence of BI, benefits of BI, factors influencing BI, technology requirements, designing and implementing business intelligence, cultural imperatives, and various BI techniques. The paper would be useful for budding researchers in the field of BI to understand the basic concepts.

Recently two distinct understandings of the term BI (respectively BI system) exist – a data-centric and a process-centric. The data-centric position uses BI systems to combine operational data with analytical tools to present complex and competitive information to planners and decision makers. The objective is to improve the timeliness and quality of inputs to the decision process [4]. BI is therefore mainly used to understand the capabilities available in the

organization[5]. The process-centric position notes a major shortcoming in this inherent data-centricity. Because the collection, transformation, and integration of data as well as information supply and analysis are commonly isolated from business process execution, a great part of the information that intrinsically exists within an organization remains either unused or is at most partially used but deprived of its interpretation context [6]. As they see an organization as a set of well-integrated processes [7]. BI therefore should be used to integrate the information world with the process world in order to facilitate decision making with an all-embracing information basis.

2. DATA MINING FOR BUSINESS INTELLIGENCE

Data mining is supported by a host that captures the character of data in several different ways.

1-Clustering: The key objective is to find natural groupings (clusters) in highly dimensional data. Clustering is an example of unsupervised learning, and it is a part of pattern recognition.

2-Regression Models: These originate from standard regression analysis and its applied part known as system identification. The underlying idea is to construct a linear or nonlinear function.

3-Classification: This concerns learning that classifies data into the predetermined categories. The term originates from pattern recognition, in which a vast number of classifiers have been developed.

4-Summarization: This is an approach towards characterizing data via small number of features/attributes. In the simplest scenario one can think of a mean and standard deviations as two extremely compact descriptors of the data. This technique is often applied in an interactive exploratory data analysis and automated report generation.

5-Link analysis: It is concerned with determination of relationships (dependencies) between fields in a database. In a particular case we may be interested in the determination of the correlation between the variables.

6-Sequence Analysis: This type of analysis is geared toward problems of modeling sequential data. Pertinent models embrace time series analysis, time series models, and temporal neural networks.

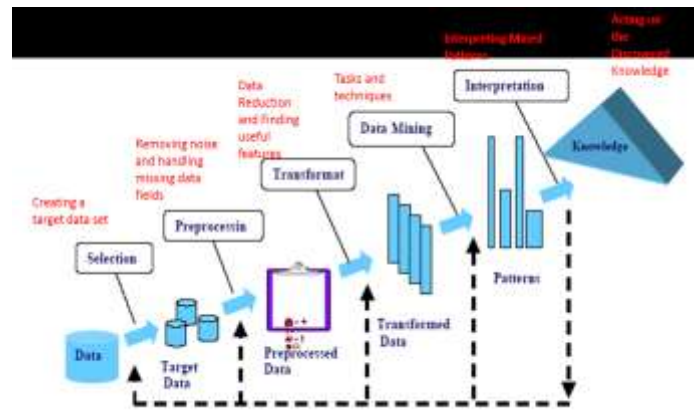


Fig.2.1 Producing Knowledge using data mining

3. ADVANTAGE OF BUSINESS INTELLIGENCE FOR DATA MINING

With the help of business intelligence solutions, organizations can implement corrections and take necessary measures to improve efficiency in various areas of their operations. An organization may also identify new business opportunities and expand accordingly to accommodate its best interests. Business intelligence software tools are highly dependent on rapidly evolving technologies like big data, predictive analytics and data mining. Many technology consultants provide specialized business intelligence tools, technology consulting, and implementation support with extensive industry expertise to help organizations assess their business intelligence needs. Below are highlights key advantages for using business intelligence tools:

- **Faster Decision Making**

Key executives are involved in making decisions that guide business direction and strategy. In the absence of business intelligence solutions, this decision making process often involves making a considerable amount of presumptions. Without the availability of detailed reports and analysis, executives may have to make decisions based on limited information like sales figures and market demand. Business intelligence eliminates this guesswork and presents new information like real-time production stats and customer feedback for various product lines that is backed by hard data. Some predictive BI techniques also allow for "what if" analysis to see how a decision would affect the company in the future. All this information provides key insights and a wider perspective, which enables faster decision making at the right time.

- **Real-time Performance Measurement**

Business intelligence tools continuously monitor large amounts of data generated by an organization and carefully analyse it for several performance metrics such as efficiency, sales figures and marketing costs related to

the business - in real time. This helps keep top management informed about the status and performance of various critical components within the organization and the collaboration between business units. It also enables business executives to detect market opportunities and take advantage of them.

• Improved Reporting Speed

BI users can access large amounts of unprocessed data in the form of organized and readable reports that present information in an interactive manner within a short amount of time. This eliminates the need to sift through loads of data and printing a pile of various reports.

• Greater Insights into Customer Behaviour

BI can analyse sales figures and customer feedback to represent facts that tell a business a great deal about their customer's preferences and needs. Using IT products as an example, logged customer information can be sent back to a company's servers to be analysed to get an idea of how the customers are responding to the design of a particular software product. Products such as Google Chrome, Microsoft Windows and others are continuously monitored and updated to keep up with the demands of customers. Analysing this information can also help a company detect what the customer is buying and what his/her needs are enabling decisions that allow the company to retain or grow their customer base.

• Identify New Business Opportunities

If a business has a numerous products, BI can help detect customer touch points where a customer buys multiple products produced by the same company on an individual basis. Such touch points can provide a company with new business opportunities to sell a group of products together as a single integrated package to retain and grow a particular customer base. Thus, by using business intelligence, opportunities, which were previously undetected, can be put used to maximize profits.

4. DATA MINING APPLICATION IN REAL LIFE BUSINESS

There are number of industries that are using data mining applications. Some of these organizations include retail stores, hospitals, banks, insurance companies, with data mining such things as statistics, pattern recognition and other important tools used to find patterns and connections that would otherwise difficult to find. This technology used in smart making decisions and business problems and solutions using data mining technology.

A. Retail Marketing:

Another example of data mining and business intelligence comes from the retail sector. A customer who spends little but often and last did so recently will be handled differently to a customer who spent a big but only once this enables them to better understand their various customer segments. Some retail applications include:

B. Banking:

Banks can utilize knowledge discovery for various applications, including

- Card marketing—by identifying customer segments, card issuers and acquirers can improve profitability with more effective acquisition and retention programs, targeted product development, and customized pricing.
- Cardholder pricing and profitability—Card issuers can take advantage of data mining technology to price their products so as to maximize profit and minimize loss of customers. Includes risk-based pricing.
- Fraud detection—Fraud is enormously costly. By analyzing past transactions that were later determined to be fraudulent, banks can identify patterns. Predictive life-cycle management—to helps the banks to retain credit card customers , data mining is applied by analyzing the past data, data mining can help banks predict customers that likely to change their credit card affiliation so they can plan and launch different special offers to retain those customer.

C. Telecommunications:

Telecommunication companies around the world face escalating competition which is forcing them to aggressively market special pricing programs aimed at retaining existing customers and attracting new ones. Knowledge discovery in telecommunications include the following

- Call detail record analysis—Telecommunication companies accumulate detailed call records. By identifying customer segments with similar use patterns, the companies can develop attractive pricing and feature promotions.
- Customer loyalty— some customers repeatedly switch providers, or “churn”, to take advantage of attractive incentives by competing companies. The companies can use data mining to identify the characteristics of customers who are likely to remain loyal once they switch, thus enabling the companies to target their spending on customers who will produce the most profit.

4. CONCLUSION

In this paper we introduced the many data mining techniques, particularly specialized methods for types of data and domains. Our paper focused on mainly on automated methods for extracting patterns or models from data. In this paper, Business intelligence is useful to obtain some guided data mining methods by identifying the related services. The core idea and information behind this architecture is to design a generic system that is flexible enough to suit to different requirement of the business. The business intelligence data of large enterprises can help to generate a very powerful knowledge base.

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