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DATA MINING TECHNIQUES SUPPORT TO KNOWLEDGE OF BUSINESS INTELLIGENT SYSTEM

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Abstract

This paper proposed an intelligent of business application generate knowledge of business application which can be integrating to data warehouse, data mining techniques. The data warehouse for this system is provided by the massive amounts of data gathered from business intelligent system. In this paper explores the applications of data mining techniques which have been developed to support knowledge management process. It is essential for improving the competitiveness of businesses and increasing access to knowledge.

Keywords: Business intelligent system, Data mining, Re engineering the business process

1. Introduction

Business processes become more and more complex and information systems support or even automate the execution of business transactions in modern companies. Business intelligence aims to support and improve decision making processes by providing methods and tools for analyzing data. Knowledge management is the engine that transforms ideas into business value [1]. It is the systematic process of acquiring, creating, synthesizing, sharing, and using information, insights, and experiences to achieve organizational goals. Every company manages knowledge. The difference between success and failure in today's competitive environment is how well a company manages and leverages its knowledge in the marketplace. The business benefits include improved competitive response, increased rate of innovation, improved organizational efficiencies and reduction of costs. Data-mining is a crucial part of Knowledge Management.

2. Data Mining in Business Process

2.1 Designing and construction of data warehouse in Business process

Data mining focus on knowledge flow and the process of creation, sharing and distributing the knowledge. In business process application, the data mining can help identify customer buying behaviour, discover customer shopping pattern and trends, improve the quality of customer service, achieve better customer retention and satisfaction, enhanced goods consumption ratios, design more effective goods transportation and distribution policies and reduce the cost of business.

Design and construction of data warehouse covers a wide spectrum (including sales, customer, employee, good transportation, consumption and services) there can be many ways to design a data warehouse for industries. This involves deciding which dimensions and levels to include and what pre-processing to perform to facilitate effective data mining.

2.2 Multidimensional analysis of purchase, sales, customers, products, time and region in process

Most industries requires timely information regarding customer needs, product sales, trends and fashions as well as the quality, cost, profit and services of commodities. Data mining provide powerful multidimensional analysis and visualization tools, including the construction of sophisticated data cubes according to the needs of data analysis.

2.3 Analysis of customer loyalty in Business

Customer loyalty card information to register sequence of purchases of particular customer. This can be useful to analyse the purchase trend from the customer in systematically. Sequential pattern mining can be used to investigate changes in customer consumption, suggest price adjustment, variety of goods to help retain customer etc.

2.4 Identify the Fraudulent form unusual patterns

It is important to identify potentially fraudulent users and their typical usage patterns, detect attempts to gain fraudulent entry or unauthorized access to individual and organizational accounts and discover unusual patterns that need special attention. Many of these patterns can be discovered by multidimensional analysis, cluster analysis and outlier analysis.

2.5 Effective of sales analysis in data mining

Sales campaigns using advertisements, coupons, various kind of discounts and bonuses to promote products and attract customers. An analysis of the effective of sales campaigns can help improve company profits. Multidimensional analysis can be used for this purpose by comparing the amount of sales and the number of transactions containing the sales items during the period of sale. Association analysis may helps to analyse the rate of product likely to be purchased together the items on sales for identify the profit.

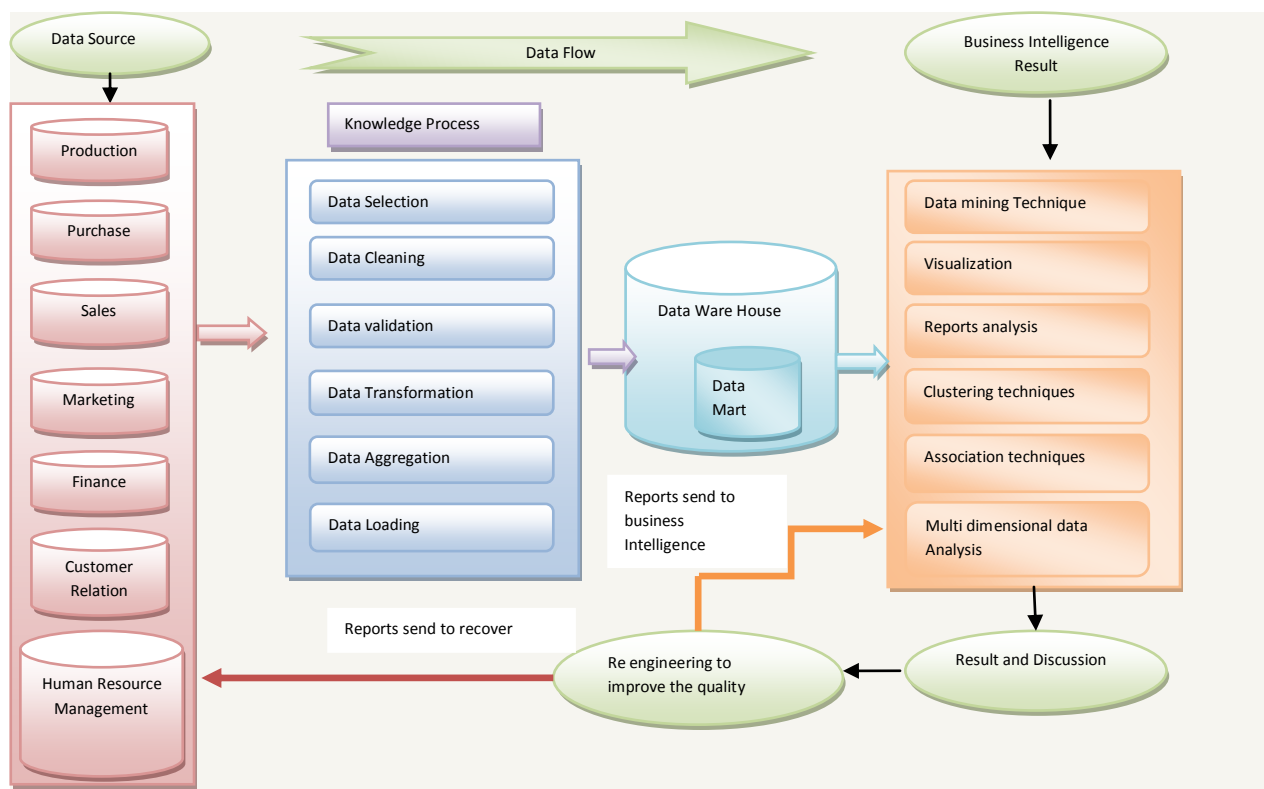


Figure 1: Data Mining Techniques Integrate to Business Process Framework

3. Data mining Application Integrates Business Process Framework

Data mining is the analysis of data for finding relationships and patterns. The patterns are an abstraction of the analyzed data. Abstraction reduces complexity and makes information available for the recipient. The data that is generated during the execution of business processes in information systems is used for reconstructing process models [2] [3].

Form fig.1 represents to analyse the business processing report through Data mining techniques. In Industries, several departments are work for their business process to meet the profit motive. Several departments are Sales, Production, purchase department, Finance department, Quality management department and customer relation management.

Data source is collects from the several department and taken into the knowledge process. Under this process data selection, data cleaning, data aggregation, data transformation, data loading process will handle for avoid the noisy data then it will transforms to data warehouse. In data warehouse store the data known as a data mart. Using data mining techniques the user will retrieve the reports whatever they need to analyse the position of the Business [7]. These models are useful for analyzing and optimizing processes. When the user wants to improve the quality of business taken from the final results, the query will be send to the data source and business intelligence part. In data source, some departments need to improve the rule, quality, change a new criteria process. Also want to improve the data mining techniques, it will be improved then the process will be continue and generate new report further.

3.1 Data mining Tasks

There are some main tasks in data mining such as

- Classification map data given by the pattern and classify a data item into several predefined classes based on similarity.
- Clustering is similar to classification except that the group are not predefined.
- Dependency Modeling (Association Rule Learning describe significant dependencies between variables for finding the required class.
- Deviation Detection is discovering the most significant changes in the data.
- Summarization or characterization maps data into subsets with associate with simple description.

3.2 Most common Techniques in Data Mining

1. *Regression Methods*: tries to identify the best linear pattern in order to predict the value of one \ Characteristic are studying in relation to another.
2. *Rule Induction*: the extraction of useful if-then rules from data based on statistical significance.
3. *Decision trees*: tree-shaped structures that represent sets of decisions. These decisions generate rules for the classification of a dataset.
4. *Genetic Algorithms*: This optimization techniques use to process such as a design of combination, Mutation, and selection based on concepts of evolution. It tries to mimic the way nature works. It is an Adaptive heuristic search algorithm premised on the evolutionary ideas of natural selection and genetics.
5. *Artificial Neural Networks*: It is a nonlinear predictive model that learns through training and resembles of biological neural networks in structure.

4. Business Knowledge Management

In this study the knowledge resource are store in the Data Mart for manipulating the data mining techniques to generate the result of the business process. Several resources are

4.1 Production

Production is the functional area responsible for turning inputs into finished outputs through a series of production processes. The Production Manager is responsible for making sure that raw materials are provided and made into finished goods effectively. Data mart maintains the details of stock of raw material, usage of raw material and how many products are turns to outcome.

4.2 Purchase

Purchasing departments evaluate the supplier's performance and quality control. To ensure that departments receive the material or service in the requested quantity, at the right time and place, at the lowest possible cost, without compromising the quality level desired by the user. For suppliers in other countries, this can also mean monitoring working conditions and workers rights. There are four methods to be followed by the Department of Purchasing in selecting suppliers of goods and services:

1. Formal Bid Process
2. Informal Bid Process
3. Direct Award Process
4. Source Selection Process

4.3 Sales

Preparing and furnishing the product for salesmen in the way of samples, sample cases, price lists, kits, portfolios, or whatever else may be necessary, depending on the nature of the business and the product or service sold.

4.4 Finance

The domain knowledge covered financial and economic data; data mining can assist banking institutions making decision support and knowledge sharing processes to an enterprise bond classification.

4.5 Customer

This was customer knowledge from household customers for product line and brand extension issues. Data mining can help and propose suggestions and solutions to the firm for product line and brand extensions. This doing by extracting market knowledge of customers, brands, products, and purchase data to fulfill the customers' demands behaviour [5] [6].

4.6 Marketing

Domain knowledge covered financial and economic data; data mining can assist banking institutions making decision support and knowledge sharing processes to an enterprise bond classification.

4.7 Human Resource Management

An organization cannot build a good team of working professionals without good Human Resources. The key functions of the Human Resources Management (HRM) team include job analysis and description, recruiting people, training them, performance appraisals, motivating employees as well as workplace communication, implementing organizational policies, workplace safety, wages and salaries, pension and benefits, dismissal and redundancy. These are the role to ensure that business manager HR policies and procedures constantly apply through all the business units, have to respond to rapidly changing markets and conditions in order to remain competitive and grow.

4.8 Re engineering the business process Intelligent

Business process redesign focuses on the fundamental rethinking of business processes, ignoring organizational boundaries. However, before implementing new business Processes, it wants to compare the existing situation with the new (redesigned) situation. Therefore, it need quickly capture and model existing processes but also new processes to achieve dramatic improvements in critical contemporary measures of performance such as costs, quality and speed.

6. Conclusion

In this paper, it can be discussed the knowledge hidden from large volumes of data has successfully solving in business or scientific problems to achieve competitive advantage. The data mining task and techniques can be integrated into the business application. It will present significance challenges for future knowledge and information systems research will implement in data mining use to business.

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