

Data Mining Applications in Marketing Strategy

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Abstract—This article describes the generation of data mining, data mining objects, tasks, and classification of data mining applications in marketing strategy. It also discusses several common data mining methods and techniques, and gives the data mining in marketing strategy in the application examples.

Key Words—database; data mining; marketing strategy

I. OVERVIEW

With the rapid development of database technology, enterprises and institutions establish a large number of database. More and more data, expanding the size of the database, result in a huge flood of data. However, the information of supporting decision is very poor, so how to change large amounts of data into decision-supporting information and how to provide decision makers a unified focus of research has become a global perspective. To solve this problem, researchers have proposed the concept of data warehouse and established in many areas of the data warehouse. But the large amounts of data often make it impossible to identify information hidden in the data warehouse and supporting decision-making. So a new data analysis technique is needed with large data and extracts potentially valuable information, therefore, data mining technology comes into being.

Data Mining (Data Mining) is the core of knowledge discovery work, the main research is

focused on the methods and techniques of finding knowledge. It is a non-trivial process of automatically extracting those useful information hidden in the data collection from it. [1]

Common data mining tasks include 6 types: association analysis, time series models, clustering, classification, error detection, prediction.

II. THE PROCESS AND CLASSIFICATION OF DATA MINING

A. A brief Introduction about the Process of Data Mining

Generally, the project of data mining covers a series of assignments: problem understanding, data understanding, collection and preparation, model-building of data mining, model evaluation and model application, etc. Among them, the systematization, engineering and methodologies of data mining process, and support systems (software or engineering) is indispensable to the solution of applicative problem.

B. The Classification of Data Mining

Data mining touches upon several disciplines, mainly including such three major technologies as databases, statistics and machine learning. It can be categorized by the type of database, the object, task, method, technology and application of data mining.

1) Data mining can be classified, according to the type of database, into relational data mining, fuzzy data mining, historical data mining, spatial data mining and many other types of data mining.

2) In addition to database (the main object) mining, data mining also includes textual data mining, multimedia data mining, and web data mining.

3) Data mining can be classified by the task of data mining into: management rule mining, sequential pattern mining, clustering data mining, classification

data mining, deviation analysis and predicting data mining and other types.

4) Data mining can be classified by data mining methods and technical mining into inductive learning, imitation biotech, the formula-finding, statistical analysis, mode mathematics, visible techniques.

III. DATA MINING ALGORITHMS AND TECHNIQUES

The method of Data mining developed from the artificial intelligence, machine learning method .it is the combination of traditional statistical analysis, fuzzy mathematics and scientific computing visualization techniques. It takes the database as its research object and from the methods and techniques of the data mining.

In fact there is no criterion which applies to judge which is superior, because the algorithms is determined by different objects and circumstances; in addition each technology has its internal limitation. There is no point

in applying the Data Mining technology without judging. In fact each algorithm can solve a corresponding problem which is better than other algorithm, the selection of a appropriate data mining algorithm has artistic quality. It is determined not only by the algorithm Performance judgments but also by the specific aims and circumstances.

Data mining algorithms and techniques can be divided into 6 categories: (1) Information theory approach to inductive learning. (2) set theory of inductive learning methods. (3) imitation of biological neural network technology. (4) imitation of genetic biotechnology Algorithm. (5) The formula found in numerical data. (6) visualization techniques.

TABLE 1. TheComparison Of Several Common Data Mining Algorithms

method	Advantage	Disadvantage	Applicable circumstances
inductive learning	using information theory to build decision tree , and finally represent the decision tree, it has a practical effect and a greater impact	the more complex decision tree is , the more branches the decision tree has. it is difficult to manage and the treatment for the missing data is not valid.	Designed for the Records. Classification or the results prediction, especially when the target is easy to understand, explain, be translated into SQL or natural language. it can be used for clustering, classification and sequence mode.
imitation of biological neural network technology.	to imitate the structure of the neurons , to predict accurate result under the complex circumstances; can handle categories and continuous variables.	Can not explain the results; types of input data requirements; vulnerable to the impact of over-training; calculation of volume. too much calculation,	In particular, the results for the model is more important than the classification and prediction of complications. It is not suitable for handling high-dimensional variables. can be used for clustering, classification and sequence patterns
imitation of genetic biotechnology Algorithm	it can handle many data types; parallel processing; it commonly used in the optimization of neural network techniques	Require too many parameters; coding difficulties; be satisfied with the solution, not the optimal solution; large computation	it can solve some insolvable problem(complex, new, hard to understand)Often integrated with other technologies for classification, clustering, association and sequential patterns

IV. THE APPLICATION OF DATA MINING IN MARKETING STRATEGY.

Database Marketing, as a new marketing method which combines the information technology and marketing theory, is the most successful commercial application of information technology. Through the collection and analysis of the large amounts of information about consumer and similar enterprises by using the process analysis techniques like OLAP (On-Line Analytical Processing) and data mining analysis techniques, the appropriate marketing strategy and specific target customer groups are determined accordingly [2].

Decision support are achieved by applying data mining to marketing strategy and the details are as follows: (1) prediction of customer purchase intention. (2) analysis of customer profitability. (3) analysis of fraudulent act. (4) analysis of the optimization of sales channels.

The most important feature of applying data mining to database is to expand the market, develop marketing strategies, and attract more customers. For example:

Which goods are sold together better? (Using relational analysis)

What are the characteristics of the customer who prefers to a commodity? (Using cluster analysis)

Which kind of customers have the above characteristics? (Using analogy analysis)

Which are the business transactions that may be fraudulent? (Using neural network)

What do high-value customers have in common? (Using category analysis)

A typical example is to draw the identity of the high-value customers and the ones that may leave by data mining. In this way, the decision will be made through formula. High-value customers will be retained and the ones that may leave will be strived for as well.

Therefore, the company's profit will be increased and its scope of business will be expanded.

V.CONCLUSION

Data mining technology is application-oriented from the beginning. It is not only a simple specific-database search and call, but also includes the data statistics, analysis, synthesis and reasoning from the angle of micro, micro or even macro, whose purpose is to guide the actual problem solving and attempt to find linkages between events, and even to predict future activity on basis of the existing data.

Data mining is widely applied in all fields including banking, production and sales, manufacturing, financial, insurance, pharmaceutical, telecommunications and etc.. There are successful application cases in many fields. As more and more business needs are constantly clear, the fields of data mining applications and problem solving become more and more widely; some application systems, such as ERP, SCM, HR and so on, have gradually integrate with data mining, with a purpose to improve the system's decision support capabilities. [1]

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