Research on the Development and Application of Computer Data Mining Technology

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Abstract. With the rapid development of computer technology, computer data mining technology has been widely used in various fields, and it has also promoted tremendous progress in society as a whole. As the economic and social development will inevitably promote the continuous skyrocketing of data in various fields, how to find useful information in the infinite data will inevitably require computer data mining technology. The article will analyze the development and application of computer data mining technology.

1. Introduction
The development history of data mining technology is not long, but the speed is amazing. Because this is a multi-disciplinary and multi-field intersecting technology, it is difficult to define it uniformly. Because the circulation of data and information has reached jaw-dropping At this point, sometimes you will encounter a huge amount of data records, high-dimensional data, and this change makes the analysis technology to be innovated. Sometimes the traditional analysis technology can only search for a small part of the available data information, in various disciplines. The data mining technology developed on the basis of technology has many functions, mainly including the following aspects:

First, you can analyze the attributes and characteristics of objects, and analyze things from the perspective of different groups. Secondly, the internal rules of the object are identified, and the objects are divided into several categories according to the rules; thirdly, for the discovery of association rules and sequence patterns, the internal rules of a certain event can be discovered; fourthly, the development law of the object can be analyzed, Make predictions about future trends. Finally, the deviation is detected and a few special cases are described.

2. Development and tools of computer data mining technology

2.1. Traditional statistical methods.
Traditional statistical methods include sampling techniques, multivariate statistical analysis, and statistical forecasting methods. Sampling technology refers to how to conduct reasonable sampling in order to avoid analyzing all data in the face of massive data; multivariate statistical analysis refers to the Analysis or factor analysis for data with higher dimensionality; statistical prediction refers to regression analysis, sequence analysis, etc.
2.2. Visualization technology.
Data characteristics are not always obvious. You can use charts and other methods to express the characteristics of the data more intuitively, including visualization methods such as scatter plots. The visualization of high-dimensional data is a difficult point in the current visualization technology.

2.3. Online analysis and processing.
This is a method to realize multi-dimensional data analysis online. Users should actively cooperate in online analysis, and proactively put forward analysis requirements, further filter analysis algorithms, and conduct exploratory analysis of data from shallow to deep.

2.4. Decision tree.
The tree diagram is based on the division of a series of rules and is used for various classifications and predictions. Its algorithms include ID3, C4.5, CART, CHAID, etc. The two new algorithms SLIQ and SPRINT currently appearing can be summarized by decision trees from a very large training set, and can handle classification attributes and continuity attributes.

2.5. Neural Networks.
Taking the human neuron function as the simulation object, it generally includes three layers, input layer, hidden layer and output layer, adjust and calculate data, and classify and summarize the results obtained.

2.6. Genetic algorithm.

![Figure 1. The architecture of the data mining system](image-url)
Based on the theory of natural evolution, a series of processes such as gene combination, mutation and selection are used as a method of technological optimization. According to the principle of survival of the fittest, it simulates the life evolution mechanism in nature to form a new group composed of the most suitable rules in the current group, and the descendants of these rules. Based on the application of this idea, the most suitable model is obtained according to the genetic algorithm, and the data model is further optimized.

The above-mentioned computer data mining technologies are all developed in the early stage. Many of them belong to the rough set method or the fuzzy set method. From the beginning, computer data mining has been positioned as an application-oriented and decision-oriented service-oriented. It can be said that due to the emergence of data mining extremely The knowledge reserve requirements of decision makers have been greatly reduced, and more and more companies have continuously invested in data mining technology research. The architecture of the data mining system is shown in Figure 1.

3. Application of computer data mining technology

3.1. Application in marketing.
The purchase of goods by users can be achieved through the application of information management systems and POS systems, especially the application of barcode technology, which is more common in the retail industry. As more and more user data is collected, it has reached artificially uncontrollable conditions. In the marketing process, the collected data is used to analyze the customer’s shopping behavior and habits, and summarize the characteristics, which has a great effect on the company’s marketing capabilities and has a great impact on the company’s market competitiveness. Great help.

The analysis of user data can only accurately analyze the purchase orientation and interest of customers through more efficient data mining technology, and business decision-making can be more accurate. Data mining in marketing can be divided into two categories, one is database marketing. The second is basket analysis. The former mainly selects potential customers through interactive query, model prediction and other methods. This is also its main task to promote its products to potential customers. Systematically analyze customer relationships, strengthen management, and conduct trend analysis for each retail store, including purchase orientation, seasonal characteristics, etc. As for the behavior of customers buying goods, some relationships are found, including how to use discount coupons to increase sales. The connection analysis of data mining is shown in Figure 2.

Figure 2. Connection analysis of data mining
3.2. Application in financial investment.
Investment appraisal and stock trading market forecasting are typical areas of financial analysis. Generally, model forecasting methods are used for analysis, including statistical regression techniques. Because financial investment is a risky area, various data must be carried out before investing. Analyze, effectively avoid various risks, and choose the best investment direction. Since the development of things has a certain trend, it can be predicted. From investment evaluation to stock market forecasting, the analysis of data can infer certain developments from it, and the existing data is processed according to the relationship between the data. Dig in depth and make reasonable predictions based on a certain model.

Identify potential frauds. The malicious frauds and malicious overdrafts that often occur in many commercial banks are very serious threats to the banks. Predicting these frauds will help reduce the bank’s risks. Generally, comparative analysis of normal behaviors is adopted. Identify with fraudulent behaviors, analyze the uniqueness of fraudulent behaviors, compare normal behaviors and fraudulent behaviors, and remind decision-makers when there is a phenomenon that requires vigilance. At present, many companies have developed this type of software to target commercial bank fraud. Carry out assessments and explore risky trading behaviors. For crimes such as the increasingly rampant money laundering activities, data mining technology can greatly improve its preventive effect.

3.3. Application in other fields.
The application of semiconductors in the manufacturing industry continues to deepen, and data is constantly generated and updated during production and testing. Analysis of these data can reveal hidden problems and ensure the quality of products. Data mining technology is also widely used in e-commerce. Because website analysis, customer consumption types and habits can all identify user behavior patterns, and save users' online browsing and consumption records, enhancing the personality of customer service. Optimize the website design.

Data mining technology can also be applied in the tax field. For those who have not paid taxes or concealed tax evasion, they can be tracked, the behavior characteristics of taxpayers in different industries can be analyzed, and the general rules can be analyzed to provide tax collection and inspection services. Strategy.

4. Conclusion
Data mining is an important tool and method. Although it is not a panacea, some potential customers and risks can be mined. Even if it cannot tell why these potential benefits or risks are formed, it can make these potential users change. For reality. Data mining technology has been widely used in many fields. With the rapid development of database and computer technology, many difficult problems in the past can now be solved by data mining technology.

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