Financial Risk Analysis and Early Warning Research Based on Data Mining Technology

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Abstract: With the development of information technology, how to mine useful information from a large amount of information and effectively analyze and guard against financial risks has become an urgent problem for enterprises to solve. This paper briefly expounds the relevant knowledge of financial risk, explains the specific application of data mining in financial risk analysis, and provides some ideas for the analysis and early warning of enterprise financial risk.

1. Introduction
With the continuous progress of science and technology, how to select valuable information from the cumbersome amount of information, and then carry out reasonable research and control on the financial risk of enterprises is something we need to deal with urgently. This paper mainly studies the practical application process of data mining in financial risk analysis, hoping to give an analysis and early warning of the financial risk of enterprises. Set help.

2. Summary of Data Mining

2.1 The Concept of Data Mining
Data mining is often applied in the current era of big data. Its core idea is to use machine learning, artificial intelligence and other methods to find useful and valuable information from a pile of data, so as to facilitate some research and application[1].
2.2 Implementation steps of data mining in financial risk analysis

(1) To clarify the content of financial risk analysis, it is necessary to clearly determine the objectives of financial risk analysis. To carry out data mining, the first thing is to clarify the objectives of data mining, so as to make the content of data mining accurate.

(2) Data collection of financial risk. To do data mining, the first thing is to prepare the data. There are many sources of data, such as accounting information system, data warehouse, or other data sources[2].

(3) Data preprocessing. Many times the data we collect may have many problems, such as incomplete data, non-standard data content, more cumbersome structure and so on. At this time, we need to deal with the data to facilitate the subsequent data mining.

(4) Data mining. Through the data pre-processed before, data mining is carried out. At this time, it is necessary to select the appropriate mining algorithm, and then wait for the completion of system data mining.

(5) Evaluation and interpretation of results. According to the purpose of enterprise's financial decision-making, it evaluates the content of data mining, checks every link of the model, and then finds the best model, makes corresponding evaluation, and explains it with the relevant knowledge of finance[3].

(6) Assimilation of knowledge. Integrate the knowledge gained from the research and analysis into the business information system, and finally practice the task of financial risk analysis. (Fig. 2)
3. Enterprise Financial Crisis Early Warning Method Based on Data Mining Technology

3.1 Financial Crisis Early Warning Index System
Financial crisis early warning system is to analyze and summarize the relevant data of the financial situation of enterprises, and then provide technical support for financial decision-making of enterprises by using data mining technology. Therefore, in the selection of indicators system, we mainly consider some of the financial data indicators in our regular enterprises.

3.2 Equal Area Division Method of Financial Crisis Early Warning Indicators
The data of financial crisis early-warning indicators of enterprises are presented with continuous random distribution. If we use more enterprises to carry out analysis, then all the indicators will show normal distribution. According to this method, we divide the time of financial crisis early-warning indicators through the distribution of indicators, and delimit them according to the area. According to the principle of enterprise life cycle, all indicators have five stages, from one to the house, and then all indicators of enterprise financial crisis warning are divided into five zones[4].

3.3 Enterprise Financial Crisis Early Warning Model Based on Dynamic Maintenance of Time Series
Based on the theory of life cycle, this paper discusses the interrelationship and development direction of financial crisis early warning indicators in each period of life cycle, and provides information support for the release of financial early warning signals.

3.3.1 Mining Method of Financial Data Based on Time Series
There are three main aspects in data mining for financial data with time series characteristics: firstly, the financial data studied has the characteristics of time series; secondly, the basic idea of data mining is to find the relevant laws and characteristics through time series data; thirdly, the final content is to find the corresponding laws through financial data. Features, and then make relevant predictions and
decisions\textsuperscript{[5]}.

![Diagram](image.jpg)

Figure 4 Data Mining Model Based on Time Series

3.3.2 Incremental mining strategy based on time series
For the incremental mining of time series, it is to distinguish the related data of enterprises according to the quarter. For example, the data of the first quarter of a year is the initial data content. Then the second quarter data is the newly added data. In fact, after the first quarter data mining is successful, incremental mining is carried out on the data of the second quarter, and then mining is carried out in accordance with the order. Mining, has been the end of data mining, time series-based incremental mining strategy as shown in Figure 5.

![Diagram](image.jpg)

Figure 5 - Incremental mining strategy based on time series

3.3.3 Dynamic Maintenance Mining Strategy Based on Time Series
Dynamic maintenance and mining strategy based on time series is based on the incremental mining of time series. In practice, financial managers of enterprises can achieve the desired control effect by setting the minimum threshold content of data, which can fully let the system play its practical role and play an important role in financial risk management and control of enterprises. There are some effects.

4. Summary
The effect of data mining technology in financial risk analysis is to warn and control financial risk. For the person in charge of an enterprise, he can build an early warning model of financial risk based on data mining technology. In many cases, if an enterprise has financial risk, it is a gradual process, if there are relevant models. The type of early warning, when the enterprise risks, can be dealt with in time to avoid greater economic losses caused by enterprises. Data mining technology has a huge application space in the field of financial risk analysis and early warning of our country's enterprises.
Our relevant practitioners should actively use data mining tools to escort our enterprises' financial work smoothly.

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