

Research on Risk Prediction and Prevention of Enterprise Human Resource Performance Management Based on Machine Learning

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Abstract: With the rapid development of artificial intelligence technology, the research of enterprise human resource performance management risk prediction and prevention based on machine learning has become a hot issue in the field of enterprise human resource management. The article firstly combs the relevant theories of HR performance management risk, elaborates the current status of machine learning application in HR performance management, then proposes the enterprise HR performance management risk prediction and prevention strategy based on machine learning, and finally analyzes the challenges of the enterprise HR performance management risk prediction and prevention research based on machine learning. The study aims to provide reference for enterprises to effectively identify and assess HR performance management risks and scientifically formulate coping strategies, so as to improve the level of enterprise HR performance management.

Keywords: Machine learning; Corporate HR performance management; Risk prediction and prevention

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In recent years, with the rapid development of artificial intelligence technology, Machine Learning (ML), as a branch of artificial intelligence technology, has been widely used in the field of enterprise human resource performance management. Machine Learning is a method of automatic analysis and learning of data through data and algorithms, which is able to predict and optimize complex problems by processing large amounts of data, discovering patterns, building models and continuously improving^[1]. Enterprise HR performance management risk prediction and prevention based on machine learning is a new type of risk prediction method, which is not only able to effectively identify and assess the risks in HR performance management, but also able to scientifically predict them and put forward the corresponding preventive measures, which is of great significance for the enterprise to prevent, identify, cope with and reduce the risks of HR performance management.

1. Theories Related to Human Resources Performance Management Risks

Enterprise human resources performance management refers to the process by which human resources managers in an organization achieve effective management and development of human resources through the application of organizational and individual capabilities, so as to achieve organizational goals. With the continuous development of China's economy, the external environment faced by enterprises is becoming more and more complex, and the requirements of enterprises for human resource performance management are becoming higher and higher. With the application of emerging technologies such as big data, cloud computing and artificial intelligence in enterprise human resource performance management, the prediction and prevention of human resource performance management risk has become the key to improve the performance

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level and enhance the competitive advantage of enterprises^[2]. Therefore, based on machine learning theory, this paper combines the current situation of HR performance management in Chinese enterprises and constructs a framework for predicting and preventing enterprise HR performance management risks based on machine learning.

2. The Current Status of Machine Learning Application in HR Performance Management

The principle of machine learning is to find patterns and laws from data, and through data analysis methods, it makes the machine have the ability to predict, recognize, reason and self-adjustment, so as to be able to automatically complete the tasks that originally require humans to complete. The application of machine learning in the field of human resources performance management is mainly focused on predicting employee performance, carrying out personnel recruitment and selection, conducting job analysis and optimization, motivating and guiding employees, etc., which can be specifically divided into three types: classification model prediction, cluster analysis and cluster modeling. Due to the technical advantages of machine learning, related research is emerging and has achieved certain results. Therefore, this part starts from the concept of machine learning, introduces the current status of related research at home and abroad, and analyzes the possible future development direction.

The research on machine learning has achieved fruitful results, and foreign research mainly focuses on the optimization and improvement of machine learning algorithms, such as the use of a variety of algorithms to comprehensively assess the effect of different algorithmic models, and to further improve the performance of algorithms, for example, by using principal component analysis, correlation coefficient method, mean squared error method, and analysis of variance^[3]; domestic research mainly focuses on the application of human resources performance management based on machine learning and the enterprise human resource performance management risk prediction and prevention. Among them, there are big differences between domestic and foreign studies in the prediction of employee performance, recruitment and selection, job analysis and optimization, and motivation and guidance for employees, mainly due to the different environments and objectives of machine learning methods, such as foreign countries focusing on the analysis of large-scale data, while domestic focusing on the management of data quality and the protection of data privacy.

3. Machine Learning Based Enterprise Human Resource Performance Management Risk Prediction and Prevention Strategy

(1) Strengthen two-way communication between employees and enterprises and improve the enterprise management system

Enterprise employees are the driving force of enterprise development, and improving the communication efficiency between enterprise employees and the enterprise plays an important role in enterprise human resource performance management. Through machine learning, employee information can be accurately collected to provide a basis for communication between enterprise employees and enterprises. In addition, on the basis of data collection, data mining technology can be used to predict and prevent risks in enterprise human resource performance management. In data analysis, by processing and analyzing the information, it can provide managers with a basis for decision-making and help them understand the psychological needs and behavioral characteristics of employees. In risk prediction and prevention, managers should improve the enterprise management system to fundamentally solve the problems in human resource performance management.

(2) Actively adjusting the organizational structure to take advantage of machine learning technology

The enterprise human resources performance management work based on machine learning technology is a systematic project, which requires enterprise managers to continuously explore, adjust the organizational structure and give full play to the advantages of machine learning technology in the process of long-term practice. First of all, enterprises need to formulate scientific and reasonable human resources performance management objectives according to their own actual situation, and clarify the performance management objectives. Secondly, it is necessary to change the traditional organizational structure that pays too much attention to the division of labor and division of responsibilities, and strengthen teamwork. Within the enterprise, human resource managers need to make reasonable distribution of personnel, clear division of labor, and develop a unified assessment standards, assessment process and assessment methods, to promote mutual learning and mutual supervision between employees. Finally, enterprises should increase the investment in machine learning technology.

(3) Building machine learning models to enhance prediction and prevention capabilities

In the process of predicting and preventing the risk of human resource performance management, constructing machine learning model to enhance its prediction and prevention ability is one of the important means^[4]. In practice, machine learning technology can be utilized to construct a machine learning model by combining the actual situation of enterprise human resources performance management. When the model is constructed, targeted data preprocessing can be carried out according to the characteristics of different data information to improve the prediction accuracy of the model. At the same time, in the process of constructing the machine learning model, a variety of different algorithms can be selected for analysis and processing, and after selecting the appropriate algorithm, various types of data can be comprehensively analyzed and processed, and the best prediction scheme can be determined through a variety of algorithmic comparisons. Finally, after the machine learning model prediction, the results are analyzed and judged to clarify the type and number of human resource performance management risks.

(4) Strengthening data collection and organization and focusing on data quality management

First, establish a unified data collection platform, strengthen data collection, organization and storage, realize data sharing between different departments and positions, and improve the efficiency of enterprise data management. Secondly, establish a data analysis platform to improve the efficiency of data processing. In the era of big data, enterprises can collect, store and analyze data in a variety of ways, such as the use of network crawler technology to capture the recruitment information of various departments and positions, employee entry information, etc.; the use of big data technology to mine and analyze employee information to find out the strengths and weaknesses of the employee's work and unusual behaviors; the use of data mining technology to measure the employee's salary and so on. Through the use of big data technology, not only can improve the efficiency and quality of data collection, but also improve the efficiency of enterprise human resources performance management.

4. Challenges of Machine Learning-based Research on Risk Prediction and Prevention of Enterprise HR Performance Management

There are still some challenges in the application of machine learning techniques in HR performance management: first, data quality. Data is the basis of machine learning models, which can provide support for the model or bias the model. Therefore, organizations need to improve data quality to ensure the accuracy and completeness of data. Second, technical limitations. Machine learning technology is developing fast, and its technology is not mature enough when dealing with certain complex problems. Therefore, there is

a need to continuously update, refine and improve machine learning technology^[5]. Third, the institutional environment. Since machine learning algorithms have certain limitations, when applying machine learning in human resources performance management, it is necessary to formulate a corresponding institutional system according to the actual situation to avoid the risks brought by the abuse and misuse of algorithms. Fourth, the talent team. Machine learning requires composite talents with specialized knowledge to process data.

5. Conclusion

To summarize, the research on risk prediction and prevention of enterprise human resource performance management based on machine learning is a systematic and scientific research, which not only helps to improve the level of enterprise human resource performance management, but also helps to enhance the core competitiveness of enterprises. At present, the research on risk prediction and prevention of enterprise human resource performance management based on machine learning is still in the exploratory stage, and although some preliminary results have been achieved, there is still a big gap compared with the international advanced level. Therefore, future research needs to be further deepened and strengthened to enhance the applied research and practical application of machine learning methods in human resource performance management, gradually establish the evaluation system and decision-making system of machine learning in enterprise human resource performance management, and promote the wide application of machine learning in human resource performance management.

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