

Research on the Application of Big Data Mining in Enterprise Talent Prediction and Talent Retention

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ABSTRACT: This study examines the utilization and benefits of big data mining technology in predicting enterprise talent. It begins by elucidating the technical foundations of big data mining and the current landscape of talent forecasting in enterprises, establishing the fundamental role of big data mining in this domain. Subsequently, it delves into the advantages of big data mining in precise talent prediction and efficient talent retention, offering substantial backing for sustained enterprise growth. Moreover, practical strategies for leveraging big data mining in enterprise talent prediction and retention are proposed, encompassing both talent prediction and retention practices. By delineating these strategies, the study aims to furnish enterprises with a comprehensive talent management framework to navigate the intensifying market competition. Ultimately, the study underscores the pivotal role of big data mining in enterprise talent prediction and retention, while also contemplating future trends in this field.

KEYWORDS: big data mining; Enterprise talent prediction; Talent retention; Practice strategy; Accurate prediction

INTRODUCTION

In the current digital era, the success of enterprises is progressively reliant on top-tier talent. Accurately forecasting talent needs and enhancing talent retention are crucial for enterprises to excel in competitive markets. The emergence of big data mining technology offers novel approaches for addressing this challenge.¹

In the dynamic and complex market environment, enterprises encounter numerous challenges. High turnover rates among employees impede the formation of a stable workforce capable of meeting development requirements. Conventional talent prediction and retention strategies are often inadequate in capturing the dynamic talent needs accurately.²

The advent of big data mining technology has created fresh opportunities for enterprises by extracting valuable insights from vast datasets. This technology offers robust support for talent management decisions within organizations. By analyzing various data points such as employee performance, career trajectories, turnover intentions, and other relevant metrics, enterprises can more precisely forecast future talent needs. Consequently, they can proactively develop talent reserves and strategic workforce plans.³

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Simultaneously, leveraging big data mining enables companies to gain valuable insights into employee needs and expectations, facilitating the development of tailored talent retention strategies.⁷ By analyzing factors such as job satisfaction, career development aspirations, and other pertinent indicators, organizations can promptly adapt management approaches and offer enhanced compensation packages, benefits, training, and advancement prospects.⁸ This, in turn, serves to bolster employees' sense of engagement and commitment, ultimately mitigating talent attrition rates.⁹

In conclusion, researching the utilization of big data mining in enterprise talent prediction and retention holds significant practical importance.¹⁰ This study can enhance competitiveness, foster sustainable development for enterprises, and offer valuable insights for advancing enterprise management theory and practice.¹¹

The second chapter is the application basis of big data mining in enterprise talent prediction Principles of big data mining technology

As a powerful tool, big data mining technology plays a key role in enterprise talent prediction.¹² Its principles cover a number of complex and interrelated aspects.

First of all, big data mining technology is based on the collection and integration of massive data.¹³ A variety of internal and external data sources, such as employee files, performance evaluations, recruitment records, industry reports, etc., are incorporated into the scope of data collection. Through advanced technical means, these scattered and diverse data are effectively gathered together to form a huge data warehouse.

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Secondly, data preprocessing is the key link. Raw data often has problems with noise, missing values and inconsistencies. Data is made more accurate, complete, and usable through data cleaning, transformation, and normalization operations. For example, the removal of duplicate data, the correction of outliers, and the harmonization of data formats lay a solid foundation for subsequent analysis.¹⁴

In feature engineering, big data mining technology can extract valuable features from massive data.¹⁵ This includes operations such as dimensionality reduction, feature selection, and building new features on the data. Through these means, key factors related to talent prediction can be highlighted, the complexity of data can be reduced, and the efficiency and accuracy of analysis can be improved.

Algorithm selection is one of the core technologies of big data mining.¹⁶ Common algorithms such as classification algorithms (such as decision trees, support vector machines, etc.), clustering algorithms (such as K-Means, etc.), association rule mining algorithms, etc., are applied to data analysis and pattern discovery. These algorithms are able to unearth hidden patterns, trends and relationships from data, providing powerful support for talent prediction.

Model evaluation and optimization are also indispensable. The model is evaluated by using various evaluation indicators such as accuracy rate, recall rate, F1 value, etc. According to the evaluation results, the model is adjusted and optimized to improve its predictive performance.¹⁷

To sum up, the principle of big data mining technology is a comprehensive system, involving data collection, pre-processing, feature engineering, algorithm selection and model evaluation and optimization.¹⁸ Each link influences and promotes each other, and provides a scientific, accurate and effective method for enterprise talent prediction.

Analysis of the current situation of enterprise talent prediction

In today's competitive business environment, corporate talent forecasting is critical to the sustainable development of enterprises.¹⁹ However, the current situation of enterprise talent prediction presents a series of complex and need to be improved characteristics.

On the one hand, many enterprises lack systematic and scientific talent prediction.²⁰ Often rely on the traditional experience judgment and simple data analysis, it is difficult to accurately grasp the dynamic changes of the talent market and the development trend of internal talents. This subjective and one-sided forecasting method is easy to lead to deviations in talent planning and cannot meet the needs of business development in a timely manner.

On the other hand, data quality and availability are also important challenges for enterprise talent forecasting.²¹ Although some enterprises have accumulated a large amount of talent data, these data are often scattered in different systems and departments, and lack effective integration and cleaning. The inaccuracy, incompleteness and inconsistency of the data seriously affect the accuracy and reliability of the prediction model.

At the same time, the lack of technical application is also a prominent problem.²² Many companies have yet to take full advantage of advanced big data mining technologies and analytics tools to extract valuable information and insights from massive amounts of data. This makes it difficult for enterprises to be accurate and timely in talent prediction, and it is impossible to lay out talent strategy in advance.

In addition, the organizational structure and culture within a company can also hinder talent prediction.²³ Poor communication and collaboration between departments, as well as insufficient emphasis on talent forecasting, may lead to the failure of talent forecasting.

Moreover, the uncertainty and complexity of the talent market also increase the difficulty of enterprise talent prediction.²⁴ The rapidly changing economic environment, the rise of new industries, and increased talent mobility make it difficult for companies to accurately predict future talent needs.

To sum up, there are many problems and challenges in the current situation of enterprise talent forecasting.²⁵ To achieve effective talent prediction, enterprises need to strengthen data management and technology application, optimize organizational structure and culture, so as to improve the accuracy and scientific nature of talent prediction, and provide strong talent support for the development of enterprises.

The third chapter is the advantages of big data mining to help enterprise talent prediction and retention Advantages of accurate talent prediction

In today's competitive business environment, accurate prediction of talent is critical. Big data mining technology provides a strong support for achieving this goal, showing a significant advantage of accurate talent prediction.

First of all, big data mining can integrate heterogeneous data from multiple sources.²⁶ Internal human resources data, employee performance data, business data, etc., as well as external market data, industry data, etc., can be effectively collected and integrated. Through the analysis of these massive and diverse data, enterprises can more comprehensively understand the characteristics and behavior patterns of talents, so as to provide a rich data basis for accurate prediction.

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Secondly, big data mining has strong data analysis ability.²⁷ The use of advanced algorithms and models, such as decision trees in machine learning, cluster analysis, regression analysis, etc., can deeply dig hidden rules and trends in data. For example, by analyzing the employee's historical work performance, training experience, career development path and other factors, the future career development potential and possible turnover tendency are predicted.

Moreover, big data mining can dynamically monitor data in real time.²⁸ Over time, the situation of employees and the market environment are constantly changing. Big data mining technology can obtain and analyze the latest data in real time, adjust the prediction model in time, and ensure the accuracy and timeliness of the prediction results.

In addition, big data mining enables personalized talent prediction.²⁹ Different positions and departments have different talent needs and development models. Through detailed analysis of individual data, a personalized prediction scheme is tailored for each employee, thereby improving the accuracy of the prediction.

Finally, the accurate talent prediction of big data mining helps enterprises plan their human resource strategies in advance. According to the predicted results, enterprises can reserve talents for key positions in advance,³⁰ rationally arrange training and promotion plans, optimize personnel allocation, and improve the overall operating efficiency and competitiveness of enterprises.

To sum up, the advantages of big data mining in accurate talent prediction provide a scientific and accurate decision-making basis for enterprise talent management, and help enterprises occupy a favorable position in the fierce market competition.³¹

Advantage of effective talent retention

In today's competitive business environment, it is critical that companies retain good talent. Big data mining has shown significant advantages in terms of effective talent retention.

First, big data mining enables precise insight into the needs of employees.³² Through the analysis of a large number of employee data, including job performance, career development expectations, job satisfaction, etc., companies can gain insight into the individual needs of employees. For example, some employees were found to have a strong desire for career advancement opportunities, while others were more concerned about work-life balance. Based on these precise insights, companies can develop targeted retention strategies to meet the key needs of employees, thereby enhancing the sense of belonging and loyalty of employees.

Second, big data mining can help predict employees' turnover tendency.³³ By analyzing information such as employees' daily behavior data, communication patterns, and interactions with external companies, companies can identify employees who may be inclined to leave in advance. This allows companies to take timely interventions, such as offering more attractive compensation and benefits, improving the work environment or providing more training and development opportunities, to retain these employees.

Moreover, big data mining can optimize the career path of employees.³⁴ Create a personalized career path for your employees based on their skills, interests and potential. This personalized career development plan can make employees feel that the company cares about and supports their personal growth, thus increasing their willingness to stay in the company.

In addition, big data mining can also promote communication and collaboration within the enterprise.³⁵ By analyzing communication data between employees, we can identify potential cooperation opportunities and teamwork patterns to create a positive and open work atmosphere. A good working atmosphere helps to improve the job satisfaction and happiness of employees, and thus reduce the turnover rate of employees.

Finally, big data mining can provide enterprises with comprehensive talent retention evaluation indicators.³⁶ These indicators include not only traditional data such as turnover rate, but also multidimensional information such as employee engagement and job satisfaction. Through the continuous monitoring and analysis of these indicators, enterprises can adjust the talent retention strategy in time to ensure the effectiveness and adaptability of the strategy.

To sum up, big data mining has many advantages in effective talent retention, which can help enterprises better understand employees, predict turnover intention, optimize career development path, promote internal communication and collaboration, and provide comprehensive evaluation indicators, so as to provide strong support for enterprises to retain outstanding talents.³⁷

Chapter four is the practical strategy of big data mining in enterprise talent prediction and retention Practical strategies of talent forecasting

In the process of enterprise development, the use of big data mining for talent prediction needs to formulate practical strategies. First of all, data collection is fundamental and critical. Enterprises should widely collect all kinds of data of internal employees, including job performance, training experience, career development planning, etc., and pay attention to talent data of external markets, such as talent flow trends in the industry and talent structure of competitors.³⁸ Through multi-channel, comprehensive data collection, build a rich and comprehensive talent database.

In terms of data analysis, advanced algorithms and models are used to dig deeply into the collected data.³⁹ For example, a cluster analysis method is used to group talents with similar characteristics in order to better understand the characteristics

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and needs of different types of talents.⁴⁰ At the same time, the use of association rules mining to find the potential correlation between talent's work performance and other factors, to provide a strong basis for prediction.⁴¹

It is also crucial to build dynamic forecasting models. With the development of enterprises and changes in the market environment, the needs and characteristics of talents are constantly changing. Therefore, the prediction model should have the ability of self-learning and optimization, and be able to adjust parameters and algorithms in time to adapt to new situations.⁴²

In addition, companies need to strengthen cooperation with specialized data analysis organizations. These institutions usually have rich experience and advanced technology, and can provide more accurate and professional talent prediction services for enterprises.⁴³ At the same time, enterprises should also develop a team of talent with data analysis skills in order to better understand and apply the forecast results.⁴⁴

In the application of forecast results, enterprises should closely combine it with human resource planning. According to the forecast results, the recruitment plan, training plan and talent reserve strategy are developed in advance to ensure that the enterprise can be prepared in terms of talent demand.⁴⁵

In short, through scientific data collection, in-depth data analysis, dynamic prediction model establishment, professional cooperation and effective combination with human resource planning, enterprises can give full play to the role of big data mining in talent prediction and provide a solid talent guarantee for the sustainable development of enterprises.

Talent retention practice strategy

In the operation and development of enterprises, talent retention is a crucial link. Big data mining provides effective practical strategies for talent retention in enterprises.

First of all, the talent retention strategy based on big data mining can achieve personalized care. Through the analysis of employees' work data, performance, career development needs and other multi-dimensional information, enterprises can accurately understand the unique needs and concerns of each employee.⁴⁶ For example, for employees pursuing career advancement, enterprises can provide them with clear promotion paths and training opportunities⁴⁷; For employees who pay attention to work-life balance, enterprises can adjust work arrangements appropriately and provide more flexible working patterns⁴⁸.

Second, big data mining helps to establish a dynamic incentive mechanism. Adjust incentives in real time based on employee performance and contributions to make them more targeted and engaging⁴⁹. For example, give material rewards and honors to employees who perform well in key projects in time; Offer stock options or special benefits to employees with long-term stability and outstanding contributions⁵⁰.

Moreover, the use of big data mining for turnover risk early warning. Through the analysis of employees' behavior data and communication records, we can identify employees who may have turnover tendency in advance⁵¹. Once potential risks are identified, enterprises can communicate with employees in a timely manner, understand their dissatisfaction and needs, and take targeted measures to solve them, thus reducing the possibility of turnover⁵².

In addition, big data mining can also optimize the internal culture and team atmosphere of the company. Through the analysis of employees' feedback on corporate culture and team cooperation, the existing problems and the direction of improvement are found⁵³. For example, if it is found that some teams have poor communication, the enterprise can organize relevant training and activities to promote communication and cooperation among team members⁵⁴.

At the same time, big data mining can provide employees with personalized career development plans. According to employees' abilities, interests and the development needs of the enterprise, the career development path is tailored for them, and the corresponding resources and support are provided to enhance employees' sense of belonging and loyalty to the enterprise⁵⁵.

To sum up, big data mining has many strategic applications in enterprise talent retention practice. By means of personalized care, dynamic incentive, early warning of turnover risk, optimizing internal culture and providing personalized career development planning, we can effectively improve the effect of enterprise talent retention and provide a solid talent guarantee for the stable development of enterprises⁵⁶.

CONCLUSION

In this study, we deeply explore the application of big data mining in enterprise talent prediction and talent retention. Through the analysis of the principle of big data mining technology and the analysis of the current situation of enterprise talent prediction, we clearly realize the great potential of this technology.

Big data mining has shown significant advantages in accurate talent prediction and effective talent retention. Accurate talent prediction can help enterprises plan human resources in advance, ensure that the required talents are obtained at the right time, and provide strong support for the strategic development of enterprises. Effective talent retention strategy can reduce the rate of talent turnover, so that the core competitiveness of enterprises can be stable and improved.

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In the aspect of practical strategy, the paper puts forward targeted and operable methods for talent prediction and talent retention respectively. These strategies are not only based on theoretical research, but also fully consider the actual operation of enterprises and changes in the market environment.

However, we should also be soberly aware that the application of big data mining in enterprise talent management still faces some challenges. For example, the quality and security of data, how to ensure that the data collected and analyzed is accurate, complete and legal compliance, is a key link that enterprises must pay attention to. In addition, the continuous upgrading of technology also requires enterprises to continue to invest resources in training and learning to ensure that relevant personnel can master and use big data mining technology.

Looking forward to the future, with the continuous progress of technology and the continuous improvement of enterprises' attention to talent management, the application of big data mining in enterprise talent prediction and retention will be more extensive and in-depth. Enterprises should actively embrace this change, constantly optimize their own talent management system, give full play to the advantages of big data mining, and provide a solid talent guarantee for the sustainable development of enterprises.

In short, the application of big data mining in enterprise talent prediction and talent retention is a research field with broad prospects and important significance. We expect more research and practice to further promote the development of this field and create greater value for enterprises.

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