

Research on the Influence of Artificial Intelligence Technology in Enterprise Human Resource Management on Employee Performance

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Abstract: With the rapid development of science and technology, artificial intelligence (AI) technology is gradually infiltrating into all levels of enterprise management, especially in human resources (HR) management. Its application not only improves work efficiency, optimizes management processes, but also has a significant impact on employee performance. This study comprehensively and deeply discusses the application of AI technology in recruitment, training and performance management and its influence on employee performance through mixed method research design, quantitative analysis and case study. The results of quantitative analysis show that the application of AI technology in recruitment, training and performance management has a significant positive correlation with the improvement of employee performance. Regression analysis further reveals the positive effects of factors such as recruitment automation, training personalization, employee experience and educational background on employee performance. The case study reveals the common patterns and differences of the impact of AI technology application on employee performance by comparing enterprises in different industries, scales and levels of AI technology application. This study provides valuable insights for understanding the application of AI technology in enterprise HR management and its impact on employee performance, and provides a useful reference for enterprises to make more effective use of this technology. With the continuous development and popularization of AI technology, its application in the field of HR management will be more extensive and in-depth, which will inject new impetus into the sustainable development of enterprises.

Keywords: Artificial Intelligence, Human Resource Management, Employee Performance.

1. Introduction

With the rapid development of science and technology, artificial intelligence (AI) technology has gradually penetrated into all aspects of our lives, especially in the field of enterprise management, and its influence has become increasingly significant. Enterprise human resources (HR) management, as an important part of enterprise management, is also undergoing a profound change driven by AI technology [1]. This change not only changed the traditional HR management mode, but also influenced the working style and performance of employees in a subtle way.

In the digital and intelligent era, more and more enterprises began to try to apply AI technology to HR management, in order to improve work efficiency, optimize management processes, and ultimately enhance the overall competitiveness of enterprises [2]. From automatic resume screening to intelligent performance evaluation, the introduction of AI technology has undoubtedly brought unprecedented convenience and possibility to enterprise HR management [3]. However, the wide application of this technology has also triggered a series of new problems and challenges, especially in its impact on employee performance.

The purpose of this study is to deeply explore how AI technology is applied in enterprise HR management, and focus on analyzing the specific impact of the application of this new technology on employee performance. Answer the following questions through empirical research: How does AI technology improve the efficiency of enterprise HR management? What positive or negative effects does the application of this advanced technology have on employee performance? The in-depth exploration of these issues will not only help to fully understand the role of AI technology in

HR management, but also provide useful reference for enterprises to make more effective use of this technology.

2. Research Method

2.1. Research Design

In this study, the mixed method is used to study and design, combining quantitative analysis and case study to comprehensively and deeply discuss the application of AI technology in enterprise HR management and its influence on employee performance [4-5]. This method is designed to ensure the scientific and practical research and provide useful reference and guidance for HR management practice in enterprises.

Firstly, the universality and effect of AI technology application are evaluated by quantitative analysis. To this end, a detailed questionnaire was designed to investigate HR management departments that have implemented AI technology. The questionnaire covers the application of AI technology in recruitment, training and performance management, as well as the corresponding changes in employee performance. By collecting a large number of data and using statistical software for correlation analysis and regression analysis, the quantitative relationship between the application of AI technology and employee performance is revealed.

Secondly, in order to have a deeper understanding of the practical application of AI technology in HR management and its specific impact mechanism on employee performance, several representative enterprises are selected for case studies. These enterprises cover enterprises in different industries, different scales and different levels of AI technology application. Through in-depth interviews, on-site observation

and document analysis, the application scenarios of AI technology in these enterprises and the resulting changes in employee performance are described in detail.

2.2. Data Collection

The data collection method of this study mainly depends on two data sources: enterprise HR management database and employee performance evaluation report.

In recent years, a technology company has widely applied AI technology in HR management, such as automatic resume screening system, intelligent scheduling software and employee training demand analysis tools based on big data. In order to deeply understand the application of these technologies, the research cooperated with the HR department of the technology company and obtained access rights to its HR management database. Through this database, detailed data about employee recruitment, training, scheduling and other links can be obtained.

We also obtained the electronic files of the employee performance evaluation report of the company. These reports record the performance score, the completion of work objectives, the supervisor's evaluation and other information of each employee in detail. By analyzing these reports, we can understand the overall level of employee performance and the

changing trend in different time periods.

2.3. Data Analysis

This study systematically discusses the application of AI technology in enterprise HR management and its influence on employee performance through quantitative analysis and data analysis methods in case studies. Regression analysis and correlation analysis are mainly used for the data collected through questionnaire survey. Qualitative data analysis method is used in case study to deeply understand the application of AI technology in actual working environment and its influence mechanism on employee performance [6-7].

3. Results Analysis and Discussion

3.1. Quantitative Analysis Results

The results of correlation analysis show that the application of AI technology in recruitment, training and performance management has a significant positive correlation with the improvement of employee performance. However, it should be emphasized that correlation is not equal to causality, and these analysis results can only be used as a reference for further in-depth research and practice. See Table 1.

Table 1. Correlation analysis results

Variable	Application of AI technology in recruitment	Application of AI technology in training	Application of AI technology in performance management	Employee performance change
Application of AI technology in recruitment	1.000			
Application of AI technology in training	0.652**	1.000		
Application of AI technology in performance management	0.587**	0.723**	1.000	
Employee performance change	0.493**	0.562**	0.614**	1.000

Note: ** indicates that the correlation is significant at the level of 0.01.

There is a significant positive correlation between "AI technology application in recruitment" and "employee performance change" (the correlation coefficient is 0.493, and it is significant at the level of 0.01). This means that when enterprises apply AI technology more in the recruitment process, the performance of employees will often improve. This may be because AI technology has improved the efficiency and accuracy of recruitment, thus helping enterprises to select more suitable employees. Similarly, there is a significant positive correlation between "AI technology application in training" and "employee performance change" (the correlation coefficient is 0.562, and it is significant at the level of 0.01). This shows that the job performance and performance of employees can be effectively improved by using AI technology to personalize the training content of employees [8].

There is a significant positive correlation between "AI technology application in performance management" and "employee performance change" (the correlation coefficient is 0.614, and it is significant at the level of 0.01). This shows that using AI technology to monitor and evaluate employees'

performance can reflect employees' performance more objectively and accurately, and may encourage employees to improve their performance through timely feedback and adjustment [9]. The results of correlation analysis also reveal that there is a significant positive correlation between the application of AI technology in different HR management links (recruitment, training and performance management). This shows that these links are interrelated and influence each other, and together constitute a complete system of AI technology application in enterprise HR management.

Regression analysis shows that the degree of recruitment automation, training personalization, employee experience and educational background are all important factors affecting employee performance. These factors play an active role in improving employee performance and provide valuable reference for enterprise HR management. By optimizing the recruitment process, providing personalized training and attaching importance to employees' experience and educational background, enterprises may be able to achieve the overall improvement of employees' performance. See table 2.

Table 2. Regression analysis results

Variable	Regression coefficient (B)	Standard error (SE)	Standardized regression coefficient (Beta)	T value	P value	95% confidence interval
(constant)	1.234	0.123	-	10.032	<0.001	[0.993, 1.475]
Degree of recruitment automation	0.345	0.067	0.234	5.149	<0.001	[0.213, 0.477]
Personalized degree of training	0.178	0.043	0.189	4.140	<0.001	[0.093, 0.263]
Employee experience	0.089	0.021	0.156	4.238	<0.001	[0.048, 0.130]
educational background	0.123	0.032	0.174	3.844	<0.001	[0.060, 0.186]

Regression coefficient shows that the degree of recruitment automation has a significant positive impact on employee performance (regression coefficient is 0.345, P value < 0.001). This means that with the improvement of recruitment automation, employee performance will also improve accordingly. This effect is still significant after controlling other variables (such as training personalization, employee experience and educational background), indicating that recruitment automation not only improves recruitment efficiency, but also indirectly improves overall employee performance by selecting more suitable employees.

The data show that the degree of training personalization also has a significant positive effect on employee performance (regression coefficient is 0.178, P value < 0.001). Personalized training can better meet the learning needs of employees, improve their skills and knowledge level, and thus show higher performance at work. This discovery emphasizes the importance of customized training programs in improving employee performance.

Employee experience also has a significant impact on

employee performance (regression coefficient is 0.089, P value < 0.001). Experienced employees are often able to complete tasks and deal with problems at work more efficiently, so their performance is usually higher. This result is consistent with common sense and verifies the positive role of experience in improving work performance [10].

There is also a significant positive correlation between educational background and employee performance (regression coefficient is 0.123, P value < 0.001). This means that employees with higher education can often show better job performance. Educational background may affect employee performance by providing a deeper knowledge base and stronger problem-solving ability.

3.2. Qualitative Analysis Results

By comparing the situation of different case enterprises, the common patterns and differences of the influence of AI technology application on employee performance are summarized. See table 3.

Table 3. Common patterns and differences of the influence of AI technology application on employee performance

Case enterprise	industry	Scale	Application level of AI technology	Common mode	discrepancy
Enterprise A	manufacturing industry	large-scale	high	Recruitment automation improves efficiency, personalized training improves skills, and performance management is data-based and objective.	Employees' acceptance of new technology is high, and their performance is improved significantly. In the manufacturing scene, the intelligent scheduling system greatly optimizes HR configuration.
Enterprise B	financial industry	medium-sized	middle	Intelligent screening is used in the recruitment process, which has rich online training resources, timely performance feedback and effective incentives.	The financial industry requires high data security, AI plays an important role in risk control, and employees are highly dependent on technology.
Enterprise C	service sector	small-sized	low	Intelligent matching was initially used in recruitment, and basic online training materials were available. Data indicators were introduced into performance management.	Employees in the service industry are highly mobile, and the efficiency improvement of AI in recruitment is particularly critical. Small enterprises have limited resources, and the application of AI technology is relatively basic.

Whether in manufacturing, finance or service, enterprises tend to use AI technology to automate the recruitment process. This automation not only speeds up recruitment, but also improves the accuracy and efficiency of screening, thus helping enterprises to find suitable talents more quickly. Enterprises in all industries have recognized the importance of personalized training and provided customized training content for employees by using AI technology. At the same time, abundant training resources are provided through the online platform to help employees improve their skills anytime and anywhere. Enterprises in different industries are trying to introduce data analysis and AI technology into

performance management, making performance evaluation more objective and fairer. Digital performance management can not only provide timely feedback, but also help enterprises to motivate employees more accurately.

In the manufacturing industry, as shown in enterprise A, employees have a high degree of acceptance of new technologies, and application scenarios such as intelligent scheduling system have a significant effect on optimizing HR allocation. Enterprise B in the financial industry faces higher data security requirements, so AI technology plays an important role in risk control. For enterprise C in service industry, it is particularly important to improve the efficiency

of AI technology in recruitment due to the high employee mobility. Employees in the financial industry are relatively highly dependent on technology, which may be related to their industry characteristics and job requirements. Small enterprises, such as enterprise C, have a relatively basic application of AI technology due to limited resources, but even so, its efficiency improvement in recruitment is regarded as the key.

Although enterprises in different industries, scales and application levels of AI technology have differences in specific implementation, they have all improved their employee performance from the application of AI technology. These differences reflect that enterprises need to make customized strategy deployment according to their own characteristics and needs in practical application.

4. Conclusion

The application of AI technology has a positive impact on employee performance. Through correlation analysis and regression analysis, it is found that there is a significant positive correlation between the application of AI technology in recruitment, training and performance management and the change of employee performance. The improvement of recruitment automation helps to select more suitable employees, personalized training can improve employees' skills and knowledge, and digital performance management can reflect employees' work performance more objectively and accurately, and encourage employees to improve their performance through timely feedback and adjustment. In addition, enterprises with different industries, scales and application levels of AI technology have differences in specific implementation, but all of them have improved their employee performance from the application of AI technology. This reflects that enterprises need to make customized strategy deployment according to their own characteristics and needs in practical application. In the future, enterprises should further explore and optimize the application of AI technology to better improve the efficiency of HR management and employee performance, thus enhancing the overall competitiveness of enterprises.

References

- [1] Gaoshanxing, & Liu Jiahui. (2018). The impact of artificial intelligence on enterprise management theory and its response. *Science Research*, 36(11), 7.
- [2] Mu Xinyan, Mao Riyong, & Wang Jie. (2023). "Temperature" or "Efficiency"? Study on the Double-edged Sword Effect of Artificial Intelligence on Employees' Work Behavior. *China Human Resources Development*, 40(9), 6-21.
- [3] Yang Wei, Liu Jian, & Wu Jian. (2020). The influence of "population-flow" configuration on the performance of core enterprises-an empirical study of artificial intelligence digital innovation ecosystem. *Science Research*, 38(11), 10.
- [4] Fu Daoming. (2020). The rise of 5G+artificial intelligence technology and its impact on education. *Contemporary Education and Culture*, 12(1), 4.
- [5] Liu Xiaoyan, Zhang Shuwei, & Shan Xiaohong. (2023). Research on Partner Identification for Technology Convergence. *Science Research*, 41(12), 2164-2174.
- [6] Zhang Heng, Gao Zhonghua, & Li Huiling. (2023). Gain or loss: the "double-edged sword" effect of artificial intelligence technology application on employees' innovative behavior. *Scientific and Technological Progress and Countermeasures*, 40(18), 1-11.
- [7] Zhang Chenghong, Chen Gang, Lu Tian, & Huang Lihua. (2021). Interpretable artificial intelligence and its impact on management: research status and prospects. *Management Science*, 34(3), 17.
- [8] He Qin. (2021). Can artificial intelligence innovation investment improve the income of employees? -Research from the perspective of skill structure mismatch. *Journal of Beijing Technology and Business University (Social Science Edition)*, 036(005), 24-36.
- [9] Wei Wei. (2022). Study on the regional heterogeneity of the impact of artificial intelligence technology on manufacturing capital premium and skill premium. *Technical Economy*, 41(11), 12-23.
- [10] Lv Rongjie, & Hao Lixiao. (2018). Study on the impact of artificial intelligence and other technologies on the labor market. *Industrial Technology and Economy*, 37(12), 7.