

# Human Resource Management in the Age of AI

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**Abstract.** With the relentless progress in information and big data technologies, the impact of HR big data on management has become more pronounced. Organizations should keep pace with the times and head towards an information management approach. The research method of this paper is literature review. By sorting out and analyzing several kinds of literature related to the application of artificial intelligence in the field of human resource management, this paper summarizes the application advantages, existing problems, and coping strategies of artificial intelligence in the field of human resource management, and puts forward suggestions for future research directions. This paper introduces the application of artificial intelligence in human resource management, including recruitment, compensation and performance management, staff training and development, etc., analyzes the problems in the application of AI in the management process, and proposes solutions to these problems. The value of artificial intelligence in the field of HR management provides a reference for the further application of AI in the future.

**Keywords:** artificial intelligence, human resources management, machine learning, information system, big data.

## 1. Introduction

Economic globalization has heightened external market competition. Organizations are now faced with the challenge of sustaining their competitive edge. How to continue to gain advantages in such a competitive environment has become a problem that enterprises need to think about. Enterprises need to adapt to the trend of the times and fully apply AI to all parts of human resource management, to ensure the smooth operation of critical areas, aiding companies in achieving a competitive advantage in the external environment [1].

Artificial intelligence is characterized by systems and algorithms capable of learning and cognition, enabling it to execute tasks typically associated with human intelligence [2]. Different from other software, artificial intelligence ensures the stability and accuracy of its application process through integrated high-quality data and fast computing algorithms [3]. From the perspective of management practice, many well-known enterprises such as Google, Microsoft, IBM, Beisen and so on have applied artificial intelligence to daily human resource management work. This measure has greatly improved the efficiency of human resource management work, showing the future trend of artificial intelligence in the field of human resource management.

The research method of this paper is literature review. The literature review method is a research method that summarizes, refines and evaluates these research results by extensively reading and understanding the existing literature in a certain field or research topic. It aims to clarify the progress of the research topic, reveal its development trend and existing problems, and provide reference and direction for follow-up research by analyzing and synthesizing the existing literature. This paper summarizes the application advantages, existing problems and coping strategies of artificial intelligence in the field of human resource management by sorting out and analyzing several literatures related to the application of artificial intelligence in human resource management, and puts forward suggestions for future research directions. In addition, the author also points out the limitations of this paper and looks forward to the future research.

Human resource management encompasses six key modules: strategic planning, hiring, training, performance assessment, compensation, and employee relations. The integration of artificial intelligence (AI) across these areas is pivotal. Drawing from scholarly forecasts on AI's potential, this paper zeroes in on AI's role in recruitment, compensation, performance management, and staff

training within HR. It identifies potential challenges in AI implementation and sets a course for future research, offering insights for ongoing studies on AI in HR.

## **2. Application of AI in the Field of Human Resource Management**

### **2.1. Recruitment**

#### **2.1.1. Resume Screening**

The traditional manual screening of resumes is a large and difficult task, which requires human resource management departments to allocate substantial human and material resources to screen suitable resumes. With the help of machine learning, a resume screening model is constructed to quickly identify and screen talents that match their positions in a large number of resumes [4]. The model can learn from the recruitment data of the company's history, and automatically analyze the characteristics and content of the candidate's resume, thereby reducing the human bias in the screening process and improving the efficiency and accuracy of resume screening.

#### **2.1.2. Candidate Matching Degree**

Pessach applied the variable order Bayesian model to the recruitment data, and constructed a new machine-learning model to optimize the recruitment of enterprises [5]. Therefore, artificial intelligence can analyze a large number of human resource management data, combined with constantly optimized algorithms, can help enterprises to achieve the efficiency and accuracy of the recruitment process to a large extent. Furthermore, the application of AI in recruitment in HR management can help reduce or avoid possible links, stereotypes, etc. in the recruitment process [6]. IBM has developed and used Watson Candidate Assistant (WCA) and IBM Watson Recruitment (IWR) to effectively interact with job seekers through AI chat machines, analyze the degree of adaptation of job seekers, and ultimately improve the efficiency of recruitment.

#### **2.1.3. Construction of Job Talent Portrait**

AI can analyze the job data and job characteristics of the employees in the position and finally construct the talent portrait of the specific position of the enterprise [7]. When there are vacancies in related positions in enterprises, AI can help enterprises quickly identify suitable candidates according to the set talent portraits, so as to help enterprises make efficient and rapid talent replenishment.

### **2.2. Compensation and Performance Management**

#### **2.2.1. Compensation Management**

Under the support of AI big data, enterprise managers can conduct a comprehensive analysis of the information data fed back by employees' working status through AI and evaluate and calculate the salary of employees in the current month according to the actual salary system standards of enterprises. In terms of compensation management, AI can also analyze market data, internal salary structure and employee performance data, and predict future salary trends, so as to provide suggestions for enterprises to formulate more scientific and reasonable salary adjustment [8]. By integrating external information from different sources and a large amount of existing internal data, IBM has developed an AI-based decision support system that can help managers make reasonable compensation plans. Meanwhile, because AI has a strong learning ability, the system can offer suggestions for the forthcoming compensation packages, informed by the actual decisions of managers, thereby improving employee satisfaction and happiness. In addition, Gupta collected and analyzed the relevant data of employees on Twitter, and finally concluded that the unreasonable salary system will negatively affect the organization and employees, thus affecting the productivity and work efficiency of the enterprise [9]. Therefore, AI can make suggestions and decisions for formulating a more scientific and reasonable salary system through the analysis and calculation of big data.

### **2.2.2. Performance Management**

Traditional human resource performance evaluation systems usually have problems of subjectivity and inefficiency. AI can make performance evaluation more objective, fair and efficient through big data analysis and powerful algorithms [10]. Human resource big data can help enterprises better understand the actual performance and potential problems of employees, formulate a plan that is more suitable for the current situation of enterprises, optimize the organizational structure, and ultimately improve the overall performance of enterprises. The intelligent performance management products created by Beisen can automatically analyze the enterprise performance process and result data in an all-round way, including performance process progress, employee performance ranking, etc. The product can assist enterprises to fully control the performance promotion process, and analyze the key nodes and target implementation of performance evaluation by data-driven analysis, so as to judge the direction of performance improvement.

## **2.3. Staff Training and Development**

### **2.3.1. Intelligent Training**

Traditional human resource training is usually a group of collective training or undifferentiated training, and this training course is not easily adaptable to the company's core training principles. This training method of AI changes the traditional way of learning and training, and transforms the training content into a more dynamic visual form [3]. AI-based training methods can fully analyze the advantages and disadvantages of employees' specific positions and their own characteristics, so as to formulate targeted training programs for employees [7]. The talent reminder function developed by IBM can help managers develop personalized training programs after analyzing big data and feedback. AI-based artificial intelligence training can not only fully mobilize the enthusiasm of employees, but also help employees to quickly master the required knowledge and skills, and enhance the personalized experience of employees.

### **2.3.2. Career Development Planning**

Customization of career development planning based on AI can develop a personalized development path for employees, and provide them with learning resources and training programs suitable for their own development by analyzing employees' learning preferences, areas of expertise and skill gaps [11]. Employees can learn independently according to their own way and rhythm, give full play to their potential in the field, so as to improve the learning effect and the matching rate of people and posts. Meanwhile, artificial intelligence can also provide real-time feedback and guidance in the process of employees' personal career development, and provide targeted learning suggestions, so as to help employees fully grasp the knowledge and skills they need to learn.

## **3. Problems of AI Implementation in HR Management**

### **3.1. Personal Level**

#### **3.1.1. Personal Data Security and Privacy Protection**

Artificial intelligence requires timely monitoring and updating of human resource big data in the application of human resource management. In order to collect big data of human resources in real time, enterprises often adopt diversified monitoring methods, including e-mail analysis, office monitoring, data analysis on mobile phones and computers, which often violate the privacy of employees [12]. In addition, while collecting and analyzing employee data, companies often face ethical issues, including data leakage, abuse of employee data by companies, and improper processing [13]. With the continuous establishment of artificial intelligence information systems, employees may face ethical privacy issues and data security issues. Clearview AI retrieves and retrieves more than 20 billion face images and related data on relevant websites such as Facebook without user consent. Therefore, in the process of applying AI to HR management activities, employees' privacy and data

may also face similar problems. How to effectively manage various forms of privacy has become one of the issues that enterprises need to focus on in the application of artificial intelligence.

### **3.1.2. Career Development Issues**

Artificial intelligence can be customized according to the employees' own areas of expertise and potential, so as to help employees have better development in their potential areas. Enterprises need enough person-job matching rate, but the career development plan customized according to artificial intelligence may not be what some employees want. Therefore, although the career planning customized by artificial intelligence is suitable for employees, the lack of sufficient enthusiasm and interest will become a problem that hinders career development. Employees cannot develop in the areas they are interested in, and their learning efficiency will also be greatly affected.

## **3.2. Enterprise Level**

### **3.2.1. Human Resource Cost and Return on Investment**

In today's era of big data, whether artificial intelligence and big data analysis can be used well is very important for the efficiency of HR management. However, the cost of human resource management invested by enterprises in data-based human resources management is often difficult to be proportional to the return on investment. Some enterprises often lack sufficient human resource big data analysis capabilities and cannot convert human resources big data into valuable information [14]. If enterprises cannot fully apply human resources big data technology, there may be problems in recruitment and training, resulting in waste of human resources costs. In the era of human resource big data, employee information is more transparent, and enterprises can use human resource big data to better understand employee needs. However, if the enterprise is unable to carry out effective management, it may increase the turnover rate of employees, resulting in increased human resources costs and reduced return on investment.

### **3.2.2. Lack of Use Scenarios**

The application of AI in the area of HR management requires enterprises to have a reasonable application system. Small and medium-sized enterprises often lack sufficient application scenarios. Due to the limitation of scale, this part of the enterprise needs to spend a higher cost to support the AI application system, so the application of human resources has a higher cost performance than artificial intelligence. Meanwhile, due to the lack of a reasonable and perfect application system, small and medium-sized enterprises cannot achieve the efficient use of AI like IBM, Microsoft, Google and other enterprises. Tyson Foods, the US food company, has reduced its recruitment cycle from 44 days to 19 days by introducing digital human resource management, significantly reducing time and costs. However, this transformation requires companies to invest considerable funds for system construction and staff training, which may be a major challenge for small and medium-sized enterprises with a relatively tight capital chain. Among them, many enterprises cannot effectively use all aspects of HR management. There are serious defects in the application of big data and timely change of data information in the work, which hinders the realization of information management in enterprises [15].

## **4. Coping Strategies of AI in Human Resource Management**

### **4.1. Enhancing Measures for Data Security and Privacy Protection**

To enhance measures for data security and privacy protection, it is necessary to formulate and implement specific laws and regulations, clarify the rights and obligations between data subjects, and provide protection for employees' data security and privacy. The organization needs to establish a perfect data security management system, clarify the protection of all aspects of data processing, and standardize data processing activities. Meanwhile, enterprises need to establish a multilevel security

protection system, including network isolation, intrusion prevention, etc., to improve the security of human resource data.

#### 4.2. Improving Employee Awareness

Enterprises need to carry out internal publicity and training to help employees fully understand the advantages of big data in enterprise and personal development, so that employees can gradually accept big data and promote the application of artificial intelligence in human resource management. Meanwhile, enterprise managers need to make timely changes to the application of big data according to employees' suggestions on relevant strategies, so as to improve the effect of artificial intelligence in HR management.

#### 4.3. Building Data Application System

Enterprises need to build a reasonable big data application system, improve its application scope and application depth, in order to achieve efficient human resource management. Enterprises need to formulate a suitable data application system according to their own scale, technology, equipment, etc., and provide comprehensive protection for their applications. Meanwhile, enterprises should continuously optimize and improve the data application system, introduce advanced theories and foundations in real time, and continually optimize the system to elevate the effectiveness of big data applications within the context of human resource management.

### 5. Conclusion

This paper first defines the concept of artificial intelligence and big data, and explains its application scope. Secondly, this paper elaborates the advantages of artificial intelligence applied to human resource management through recruitment, compensation and performance management, employee training and development, and then leads to potential problems in the application process. On the basis of the analysis of the problems, this paper expounds the corresponding countermeasures, including strengthening data security and privacy protection, improving employee awareness, and building a data application system.

This paper offers an overview of the solutions and issues in AI's implementation in HR management, extracted from a survey of relevant documents, and summarizes the coping strategies. However, this paper lacks specific data theory support, and further field research and data collection are needed to support further analysis and conclusions.

This paper synthesizes the existing literature on AI and big data applications in HR management, detailing the issues and the strategies for dealing with them. It envisions that future research could assess AI's impact from a variety of angles and could be expanded through empirical data collection.

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