

Application of Artificial Intelligence in Human Resource Management

-- The Way of the Future

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Abstract

With the advent of the fourth industrial revolution, major technology leaders at home and abroad are focusing on the research and application of artificial intelligence, and the application of artificial intelligence to various other fields has become a trend. How to apply artificial intelligence technology to human resource management of enterprises to improve enterprise management and gain competitive advantage in human resources has become the focus of attention of each enterprise. Based on factual data, this paper discusses the current situation and practical theoretical mismatch in the field of AI application in HRM, proposes targeted solutions for outsourcing AI services, and finally summarizes and analyzes the future development focus and direction of AI application in HRM.

Keywords

Human Resource Management; Artificial Intelligence; Artificial Intelligence Outsourcing Services.

1. Introduction

The competition of enterprises in the new era tends to be the competition of talents, and enterprises pay more and more attention to human resource management. Brooks believes that the arrival of the era of artificial intelligence will bring great value-added to the field of human resources and will promote the development of human resources, which can be enhanced with artificial intelligence technology . [1] The combination of HRM and AI in the new era is an inevitable development trend, and if AI can be universally applied to HRM, although it will cause adverse social impacts, such as impacting the existing employment structure, simple and repetitive HR operations will be completed by AI, and people who do not have strong professionalism and flexibility will be replaced and thus cause unemployment problems, but this is the development of new things However, this is the painful process that new things must go through, which will lead to the adjustment of the human resources personnel structure. In the long run, the successful application of AI in HRM will promote the change of the whole HR industry. On the one hand, the addition of AI makes the recruitment of talents more accurate, the training more efficient, the performance management more standardized, and the overall quality of HRM improved, on the other hand, AI will reduce the various HR costs such as labor use, training and talent loss. [2].

However, in reality, although AI has been developed in many fields, it has not made a significant breakthrough in the application of organizational management, especially human resource management. Due to the difficulty of research and development technology, high investment cost, lack of talents, uncertainty of future benefits, etc., the application of AI in HRM is not common, and only a few large companies are willing and able to use it. In this paper, we will

discuss the practical problems of AI application in HRM based on facts from the current situation, and give solutions to deduce the future development direction.

2. The Current State of Development of Artificial Intelligence

2.1. The Concept of Artificial Intelligence

Kapland and Haenlein (2019) Artificial intelligence is defined as a system capable of correctly transforming external data, where the system relies on inputs from big data for deep machine learning so that it can adapt to the needs to accomplish specific goals and tasks. [3] The current research in AI continues to be divided into six main systems, involving machine learning, robotics, knowledge representation, computer vision, automated reasoning, and natural language processing. Essentially artificial intelligence is a large amount of data extracted from cases based on external inputs, input data and use core algorithms to allow the machine to imitate human processing information, through the accumulation of data induction and collation to allow the machine to continue to learn, so that it can feedback on external information processing such as speech recognition, perception recognition, etc., and ultimately output predictive reasoning, diagnostic decision-making information to enable the machine to perform or assist the work of humans. The meaning of artificial intelligence is to be able to turn a large amount of data into information, and turn information into knowledge wisdom to make independent decisions or assist human beings.

2.2. The Development Stage of Artificial Intelligence

Scholars have made different divisions of the development stages of AI based on different criteria. kapland and Haenlein (2019) divided AI into three stages based on its maturity level: primary intermediate and advanced, [3] as shown in Table 1. The primary intermediate and advanced stages correspond to what we usually call weak AI, strong AI and super AI stages, and according to the classification criteria it is known that AI is still in the weak AI stage. Artificial intelligence has not yet fully developed to the advanced stage, and does not yet have self-awareness and all the functions covering perception, cognition and behavior. Due to these deficiencies, AI is not yet capable of innovating on its own as humans do. [4] Although AI technology has made breakthroughs in deep learning, the overall technology of AI is still being developed and researched around rationality and feasibility.

Table 1. Artificial intelligence development stage division

Stage	Applicable industries	Independent problem-solving ability
Primary Stage	Specific industries	Not available
Intermediate Stage	Multiple Industries	Solve some problems independently
Advanced Stage	Any industry	Solve any problem independently

3. The Current Situation and Problems of Artificial Intelligence Applied to Human Resource Management

The potential of AI applications for HRM has been theoretically explored by Stefan Strohmeier and Franca Piazza (2015), who proposed artificial intelligence neural networks for turnover prediction, knowledge-based search engines for candidate search, genetic algorithms for employee rostering, text mining for HR sentiment analysis, information extraction for resume data collection, and interactive voice response for employee self-service. [5] The full potential of the theory does not mean the popularity of the practice, the reality is that the AI products

applied to HRM but only a few and not many, in 2016 the United States launched HRTech, a comprehensive service platform for HR technology, in 2018 a Silicon Valley company launched artificial intelligence recruitment management tool Hiretual version 3.0, the domestic staff power cloud platform mainly has to help companies The da help network SaaS cloud service that solves social security payroll problems, and the HRMIS system that helps accurately handle employee files. At present, we are in the development stage of weak artificial intelligence, the functions of these products need to be improved and progressed, and the division of products is not detailed enough to provide customized services according to the different specific needs of enterprises in payroll, performance and employee relations, etc. The technology of artificial intelligence is mastered and introduced by a few large companies, and is not commonly applied by enterprises.

Research by SHL, a leading global measurement agency, shows that the potential of talent selection based on big data still needs to be explored, with 38% of companies indicating that it will take some time to perfect the practice of using big data for talent selection. 17% of companies indicated that the specific application of big data artificial intelligence is just blindly following the trend. In the 2018 China Enterprise HR Digital Maturity Survey Report, 281 Chinese companies participated in the survey, with the largest proportion of companies handling business manually and those using video remote interviewing together accounting for more than half.

The use of artificial intelligence requires companies to build artificial intelligence platforms, combined with the company's specific human resource management needs to build artificial intelligence application scenarios and implementation systems, which require companies to invest a lot of time and energy, and whether the company can adapt to the new human resource management model to bring benefits to the enterprise after investment is still unknown. This risky investment and return is not supported by sufficient strength, which makes many companies have doubts and finally discourage. Finally, the lack of talent, on the one hand, is the scarcity of artificial intelligence technology talent, on the other hand, if companies want to use artificial intelligence in human resources management, which requires managers and employees can master how to use to adapt to the new changes brought about by artificial intelligence technology, which puts forward new requirements for human resources managers and practitioners to practice skills. Technical difficulties, high capital requirements, high risks, lack of talent, and other issues limit companies from taking concrete practical measures to apply AI to HRM.

4. Solutions to Problems in the Application of Artificial Intelligence in Human Resource Management

The solution proposed in this paper to the above problem is to outsource human intelligence services, which specifically means that companies do not develop their own artificial intelligence systems for human resource management, but cooperate with companies that specialize in providing artificial intelligence technology services in this field, outsourcing the technical aspects of the companies themselves only need to select and adapt to the new technology. To achieve this situation, on the one hand, the state needs to encourage and support the birth of companies that provide specialized AI technology services, and on the other hand, this cooperation puts requirements on both sides of the cooperation.

For companies that provide AI technology services, the application of AI technology should not only meet the task needs of HR, but also need to go beyond the existing technology that is already in use. If the use of AI to predict the probability of employee turnover and the results achieved by a simple interview between an employee and a line manager are consistent then AI, then the application of this AI technology will be ineffective. It is usually not feasible to

simply provide pure AI technology and expect the company receiving HR services to adapt the technology to their needs and then use the AI technology to solve the problem. Applying AI to accomplish real HR tasks is a challenging and daunting task that requires both extensive AI and HR knowledge. Companies providing AI services need to focus on developing "customized" HR applications, which may well be achieved by embedding AI directly into specific HR information systems. unfamiliar AI technologies.

For companies receiving AI services, they must improve the requirements for HR managers and employees, pay attention to assessing employees' understanding and familiarity with the application of AI technology in recruitment, as well as strengthen the training on AI application and operation in training, so that managers and employees can correctly use the introduced AI technology to solve problems and complete tasks.

This two-way cooperation makes AI technology from unfamiliar technology into a good helper that companies are familiar with and can quickly get started with specific operations to complete the company's human resources tasks. The cost of purchasing AI services will be much lower than the cost of the company's own AI technology research and development, and AI services from specialized AI technology research and development companies, companies have their own division of labor, both to create new demand, but also directly reduce the company's concerns about the application of AI technology to human resources management, to help companies better put AI technology into practice.

5. Summary of the Application of Artificial Intelligence in Human Resource Management and Future Development Trends

In terms of the nature of thinking, the fundamental difference between AI and automation is that AI has self-awareness and object-awareness. [7] Interpreted from the conceptual level, the application of AI is not simply AI technology plus something, but the AI technology can be integrated into a certain field after joining it, making the original work in the field more efficient and convenient, which may bring changes in the way of work in the short term but will bring positive effects to the field in the long term, and the two should be complementary without any sense of incongruity. For example, the application of face payment in retail supermarkets changes the way people pay for shopping in the short term, but in the long term it facilitates people's lives and is eventually promoted gradually. Access to artificial intelligence is the result, not the cause, of companies reshaping the industrial value chain. The correct process is to sort out the industrial chain, find the key places in the industrial value chain where there is room for optimization, and then prescribe the right medicine. [8] Simply adding some artificial technology into a certain field such as Alibaba's unmanned supermarket and unmanned hotel, in the current view it is only an attempt, and cannot be considered as a real application of AI technology, thus both of them are not able to realize the promotion and application in the current society.

The application of artificial intelligence in human resource management is also the same, first of all, artificial intelligence applied to human resource management is not simply a computer network + human resource management, the simple use of the network to screen job seekers, the combination of online network training and offline training, etc. is only the combination of computer network technology and human resource management. Secondly, the positioning of artificial intelligence in human resource management is always a technical tool, a way means, and the third industrial revolution computer network technology, artificial intelligence is always a technology in essence, no matter how far this technology has developed, it is applied to human resource management change is always the work form of human resource management. The HRM model itself is constantly developing and improving, Zhao Shuming et al. (2019) point out that from the first labor management, to mechanized HRM model,

moderately humanized HRM model, highly humanized HRM model, and autonomous HRM model. [9] The specific HRM work style will be updated and iterated, but artificial intelligence will not change the essence of HRM. The ultimate purpose of artificial intelligence applied to HRM is through the advantages of artificial intelligence technology itself, artificial intelligence is enough based on cloud computing, big data and machine learning to replace some procedural work in HRM work, [10] relying on data to generate more valuable information to assist HR managers to make the right decision, its essence is to help enterprises to better complete the human resources management in the selection, training, training, and autonomy of HRM with the advantages of artificial intelligence. [11] The essence is to help enterprises to better complete the tasks of human resource management in the four aspects of selection, training, employment and retention, human resource planning, recruitment and allocation, training and development, performance management, compensation and benefits management, and labor relations management in six functional areas.

At present we are still in the primary stage of artificial intelligence, the development of artificial intelligence technology in human resource management itself is very difficult, the practice of applying artificial intelligence technology in human resource management of enterprises lags behind the theory in this regard, the future application of artificial intelligence in human resource management should be developed in the direction of division of labor outsourcing, there are companies in the market that provide artificial intelligence technology services, go to the artificial intelligence The market has companies that provide AI technology services to provide specialized customized services to help integrate AI technology into general business, this outsourcing cooperation form that saves money energy talent and other problems will make the benefits of AI technology popular to more companies.

References

- [1] Brooks, R.A. Intelligence without representation. *Artificial intelligence*. 1991, 47(1-3), p.139-159.
- [2] Prasanna Tambe, Peter Cappelli, Valery Yakubovich. *Artificial Intelligence in Human Resources Management: Challenges and a Path Forward*. 2019, 61(4):15-42.
- [3] Kaplan, A., & Haenlein, M. Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence, *Business Horizons*, 2019, 62(1), pp. 15-25.
- [4] Zhao Yixuan, Zhao Shuming, Luan Jiarui. Human resource management based on artificial intelligence: Theoretical model and Research prospect [J]. *Nanjing Social Sciences*, 2020(02):36-43.
- [5] Stefan Strohmeier and Franca Piazza, *Artificial Intelligence Techniques in Human Resource Management--a Conceptual Exploration*, *Intelligent Techniques in Engineering Management [M]*. Springer International Publishing Switzerland: Springer, Cham, 2015: pp 149-172.
- [6] Kaushal, Neelam, Kaurav, Rahul Pratap Singh, Sivathanu, Brijesh, Kaushik, Neeraj. Artificial intelligence and HRM: identifying future research Agenda using systematic literature review and bibliometric analysis [J]. *Management Review Quarterly*, 2021 (prepublish).
- [7] Svetlana Evseeva, Oksana Evseeva, Andrei Burmistrov, Maria Siniavina. Application of artificial intelligence in human resource management in the agricultural sector [J]. *E3S Web of Conferences*, 2021, 258.
- [8] Chao Lei, Qi Xiangyu. Artificial intelligence +HR, the future that is Happening -- Dialogue with Zhang Chaolei, Chairman of Eqifei (Beijing) Human Resources Technology Co., LTD. *Human Resources*, 2017-12.
- [9] Zhao Shuming, Zhang Min, Zhao Yixuan. Human Resource Management in the past century: Evolution and development [J]. *Foreign Economics and Management*, 2019, 41(12):50-73.
- [10] Wei Bin Zhu. Reconstruction of Human Resource Management Under Big Data and Artificial Intelligence [J]. *Journal of Physics: Conference Series*, 2020, 1533(4).

- [11] Lili Qiu and Lei Zhao. Opportunities and Challenges of Artificial Intelligence to Human Resource Management[J]. Academic Journal of Humanities & Social Sciences, 2019, 2(1).