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The impact of artificial intelligence on human resource management systems - Applications and risks

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Abstract. Organizations' traditional human resource management model has been impacted by the ongoing optimization and advancement of artificial intelligence skills and technology, and the broadening of its application scope. The impact of artificial intelligence (AI) systems on employee recruitment, human resources allocations, and talent management is significant. This paper examines the interplay among AI, data applications, human resource management (HRM) systems and the resultant effects. It will examine the significance of effectively managing the deployment of AI systems, as existing literature defines. This study examines the effects of artificial intelligence AI technology on the effectiveness of company administration compared to traditional human resource management systems (HRMS). Several recommendations are offered to enhance the reformation and optimization of the organization's human resources (HR) division. The research findings indicate that incorporating the new system in conjunction with human involvement can significantly enhance the efficiency of employee recruitment, allocation of human resources, and management of talent within the firm. There was an improvement observed in both employee happiness and productivity elements.

Keywords: Artificial Intelligence, Human Resources Technology, Talent Management, Employee Recruitment, Allocation of Human Resources.

1. Introduction

The advancement of Artificial Intelligence (AI) and the subsequent incorporation of business discourse around its worth have engendered a discourse surrounding its potential. AI technologies provide numerous benefits across various domains [1]. Various advantages have been identified based on the existing HR reports and management literature. These advantages encompass a range of areas, such as enhancing the effectiveness of employee recruitment, leveraging algorithms to enhance organizational performance, implementing dynamic monitoring, conducting big data analysis and forecasting, achieving risk balancing, and employing net present value management, among others [2]. The utilization of AI technology has facilitated enhanced operational efficiency within numerous firms [3]. Nevertheless, certain deficiencies exist in implementing Human Resource Management (HRM). The primary emphasis lies on two facets: firstly, a significant portion of existing research solely addresses the cloud computing and algorithmic methodologies employed in AI systems for corporate entities while neglecting the managerial dimensions [4]. These components encompass several elements, such as employee recruiting, employee training, human resource scheduling and application, and talent

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management policies. This research posits that the examination of the influence of AI systems on firms solely from a computational perspective is unfounded and biased. Furthermore, it is worth noting that a substantial portion of academic research, corporate sustainability reports, and annual company reports presently incorporate a considerable level of analysis of firm risk. The aforementioned factors encompass systemic risk, non-systemic risk, security and privacy concerns, employee collaboration, and performance risk. Nevertheless, there has been a dearth of scholarly examination of the prospective hazards that AI systems may present to the domain of human resource management. It is a primary area of emphasis within this study. Hence, this paper will concentrate on two distinct points about the precise ramifications of AI on human resources (HR) systems and the associated hazards through examining the viewpoints, comprehension, and expertise of managers and AI professionals in implementing or utilizing artificial intelligence within their respective contexts. The anticipation is that this research will offer a valuable framework for the governance of artificial intelligence inside organizational contexts [5].

2. Literature Review

2.1. Practical definition of artificial intelligence systems in human resources management systems

This research will employ a fusion of two distinct systems, namely Artificial Intelligence Systems (AIS) and HR technology, to comprehensively delineate the contemporary emerging Human Resource Management System (HRMS) [6]. The literature utilized in this study encompasses a comprehensive elucidation of the concepts of an Accounting AIS and Human Resources Technology (HR tech) system [7]. It also delves into the historical background of the genesis and evolution of these systems, as well as their significance and utilization within organizations. Furthermore, the literature explores the prevailing trends and prospective implications associated with implementing and adopting AIS and HR tech systems [8].

2.2. Employee Acquisition, Staff Assignment, Talent Management System

This paper will focus on three different directions of AI systems for talent recruitment, staffing alignment, and talent management. Therefore, it will use academic literature that is widely cited and can affect the company's operations. The primary emphasis of the literature will revolve around the use of AI in talent acquisition. Specifically, it will explore how AI may assist human resources (HR) in activities such as resume and job posting screening, recruitment process optimization, interview automation, and other related tasks [9]. Additionally, the literature will delve into the role of AI in intelligent analysis, data recognition, and dynamic feedback within the employee recruiting process. Staffing adjustment is mainly included in the company's "dynamic staff management" and "intelligent talent allocation," including but not limited to time adjustment, job content adjustment, job allocation, staff collaboration, performance measurement, sustainability, and managerial level. Staff scheduling research and judgment, employee dynamic analysis. The talent management system centered on training special talents for some positions and the well-being of employees, AI system for employee loyalty, employee satisfaction, special talent training, special talent services, intelligent deployment and innovative applications related to talent management [10].

2.3. Risk and Fairness

The scholarly sources utilized in this study primarily center around two overarching risk categories: internal risk and external risk. The internal risks encompass several vital factors, including the potential for privacy and security concerns encountered by the company's management, the risk associated with utilizing functionality, the risk of collaboration, and the systemic risk. External risks encompass a range of potential hazards, such as social and legal risks. Nevertheless, the primary focus of this study pertains to the various categories of risks and their overarching definitions rather than delving into the specific detrimental effects of these risks and the strategies employed to alleviate them. Additionally, the matter of fairness arises. This report will examine the ethical concerns arising from using AI systems, primarily

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based on interview data and supplemented by internal managerial discussions within the organization [11].

3. Methodology

The research methodology of this thesis is qualitative. Since a considerable amount of quantitative research already exists in the field of Artificial Intelligence, and that kind of research focuses on the design of AI programs, database building, function modeling, and other directions, there is no good enough qualitative research at the management level to support the application of such algorithms. Therefore, this report focuses on the definitional as well as the application level, aiming to describe the application of AI in the HRM sector and general recommendations. The main qualitative research methods used in this include interviews and observations.

3.1. Interviews

This study includes a sample of six to eight managers in the context of interviews. This study's primary emphasis lies in examining contemporary financial industry managers. The financial industry is at the forefront of benefiting from AI technologies, and it is common for large financial businesses to encounter various challenges in human resource management. Hence, a cohort of executives from Ernst & Young, BNP Paribas, and KPMG were selected as interviewers for this study. The interviews were conducted for two hours, utilizing an Internet conference format. The discussions encompassed many topics, along with the inclusion of several inquiries.

- Evaluation of the company's current management situation, knowledge of the company's manpower system and its dynamic management.
- Perspectives on Artificial Intelligence Systems
- Have a good understanding of HR tech systems. As well as the application of this aspect in your own company, including recruitment, resource allocation and talent development.
- Availability of AI systems in use and risk assessment of the existence of such systems.

Following the conclusion of the interviews, the transcripts and responses obtained were compiled and presented in an impersonalized format. This paper aims to provide an objective reflection on the present utilization of AI systems in human resource management within financial frontier enterprises, as well as an analysis of the associated hazards. The findings are succinctly presented in the concluding outcomes.

3.2. Observations

The study involved two primary approaches: interviews with organizations utilizing the HR tech system and subsequent return interviews to get additional insights beyond the official questions. In contrast, by drawing upon the University of Melbourne's open management courses, such as "Managing Organisational Behaviour" and "Managing Business Analytics," we have extracted the requisite material to augment the elucidation and implementation of AI management.

In addition to the aforementioned point, this report must be declared in advance. While conducting interviews and making observations, various aspects related to ethical concerns and the development of personal privacy have been identified. This study uses open-ended questions and pre-interview communication with the participants to facilitate a seamless interview procedure. The paper identifies distinct concerns regarding the ethical utilization of AI systems and safety issues.

4. Results

4.1. Artificial Intelligence System (AIS) and Human Resource technology (HR tech)

The development of AI systems has a long evolutionary history. John McCarthy coined "artificial intelligence" and researched algorithms and application design. At the same time, the emergence of expert systems in the mid-1970s and 1980s marked the initial application of AI systems to cutting-edge industries such as healthcare and finance. In the 21st century, computers have become increasingly

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popular with the development of the Internet [12]. The 21st century saw the development of the Internet using computers and neural networks, making machine learning a trend that began to be used in business analytics after 2006. In the 2010s, big data technologies such as Hadoop and Spark made storing and processing large data sets possible. And then, the advent of cloud computing was the foundation of modern smart management technologies. After 2018, AI began to be incorporated into HR management systems for automating hiring processes, performance reviews, and even predicting employee turnover. Similarly, customer relationship management (CRM) systems like Salesforce started integrating AI for customer segmentation and predictive analytics. Only since then have AI systems formally become closely associated with HRMS, and practical application possibilities have emerged [13].

Human Resource Technology (HR Tech) originated in 2016, similar to the birth of Fintech, and refers to a variety of technology tools and software used to assist in managing an organization's human capital. These technologies have enabled the streamlining and automation of many of the traditional processes associated with human resource management. Over the last seven years, HR technology has changed significantly, especially with cloud computing, machine learning, and artificial intelligence advances. Many applications and classifications have been born, including but not limited to Recruitment, Onboarding, Workforce Analytics, and other departments and related applications [14].

During the interviews, all eight managers indicated that their companies have carried out AI management systems for HR management, and three leaders indicated that their companies have complete HR tech for specific company departments.

- "Seriously, our company already has a great AI recruiting system for managing recruiter information, a round of screening for resumes, and dynamic supervision... It has been a good experience, and streamlining the traditional interview process has been able to help us locate the talent we need. The time spent, as well as the cost of hiring, can be significantly reduced." (Interviewee 1)

4.2. Employee Recruitment

Based on the empirical findings from the interview data, it is evident that most contemporary leading financial firms possess a comprehensive human resources technology system primarily utilized for talent acquisition. This phenomenon shows the extensive time investment, personnel allocation, and recruitment expenses required by the conventional human resources department during talent acquisition. Simultaneously, if a company fails to filter the resumes sent by applicants worldwide, it may result in the loss of valuable talent and potential omissions. Human resources technology has the potential to address this issue more suitably. The advantages of this can face the following characteristics [15].

First and foremost, artificial intelligence can efficiently assess a substantial volume of curriculum vitae (CVs) and identify the most appropriate candidates by considering keywords and other relevant criteria [16]. This practice reduces time consumption for recruiters and guarantees effectiveness in evaluating candidates. Additionally, AI can facilitate automated interviews, wherein video interviews can be examined using AI tools. It enables firms to enhance the efficiency and objectivity of interviews by utilizing AI to evaluate many elements, including facial expressions, tone of voice, and body language. Furthermore, artificial intelligence (AI) can be utilized for performance prediction. Through the analysis of data about the past performance of candidates, AI can forecast a candidate's potential performance when engaging in various tasks. This feedback can be submitted to the Human Resources department of a company in order to enhance their prospects of getting chosen by elucidating the necessary actions they should undertake. Using AI tools to analyze profiles and enhance time management in the recruiting and selection process generally yields time and cost savings. It enhances the process's efficacy and impartiality. This feature enables recruiters to allocate their attention towards higher-level responsibilities and guarantee the selection of the most suitable candidate for the position.

Applicant Tracking Systems (ATS) is one of the more sophisticated AI use cases available to automate, streamline, and improve recruitment. The system is a centralized platform for posting job vacancies, receiving applications, screening CVs and other recruitment information, and managing candidates throughout the recruitment cycle. It is widely used by many companies and was mentioned

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during the interview due to its advantages, such as low cost, short time, reduced brain drains, and efficient process.

- "I have to say that the use of the ATS system has brought a lot of convenience to the company. The company receives tens of thousands of job applications every year from international students from Australia or other parts of the world. Most of these students are in the finance and IT industries and have different internships and work experience, which brings a lot of trouble to our reviewers... With the ATS system, we no longer need to review the CVs one by one, but to make a certain screening through the database background, and then according to the needs of different departments to select candidates with work experience or even worked in similar companies. This system can also help us design the interview process and even the interview questions. The system also helps us design the interview process and questions, saving us a lot of time in our recruitment cycle. and in the past two years, the new employees of the company have very good working ability, and they are also more suitable for their departments." (Interviewee 3)

In addition to Applicant Tracking Systems (ATS), there has been a rise in the utilization of AI-driven screening methods. These methods are employed not only to screen curriculum vitae (CVs) and process data but also to comprehend candidates' backgrounds, analyze their behavioral patterns, and even forecast their potential for success after integrating into an organization. Additional features, such as Natural Language Processing (NLP), Predictive Analytics, and Skill Assessment, have been incorporated to enhance the precision of the screening process. Human resources technology has already demonstrated favorable practical outcomes in personnel recruitment. With the continuous advancement of AI and machine learning technologies, highly refined and precise AI-powered screening systems are anticipated to develop further.

4.3. Allocation of human resources

HR tech has also revolutionized the reallocation of human resources. It mainly focuses on two different aspects: one is people analysis, and the other is people movement. The personnel analysis aspect is mainly through the artificial intelligence system to analyze the current employee's work situation, generally using the employee's work performance in the last six months, physical condition, attendance rate, and meeting returns, adding data predictions to infer whether the employee is capable of performing the job in the future, or even the probability of problems in the job position [17]. It can help company management to make timely adjustments, and the core of such adjustments is also based on the artificial intelligence system to give the adjustment strategy. Ensure that employees can perform their jobs and produce good results. It will also help the company to reduce the problems caused by ignoring the personal demands of the employees to a certain extent. Personnel scheduling is through the algorithmic system for the entire company's management level to carry out dynamic supervision, all the staff allocation and mobilization information into the artificial intelligence system, and the artificial intelligence system will make regular updates and feedback to confirm the employee's departure, travel or in-service status, to ensure that the company's normal flow of workflow smoothly.

Furthermore, the utilization of HR technology systems can contribute to enhancing employee engagement. These systems provide the monitoring of employee satisfaction, as well as the provision of motivation and encouragement to employees, fostering their development and enabling them to achieve their utmost capabilities. Surveys Tools is a software program designed to monitor employee status. It is integrated with the company's time and attendance system, enabling tracking of employees' daily activities. Communication platforms are widely used online networks that function similarly to a company's intranet. They provide a means for employees to maintain communication with one another, facilitating problem-solving inside the workplace. Additionally, these platforms can be utilized for reporting instrument repairs or organizing online meetings. The software can facilitate instrument repair and conduct online meetings. In contrast to conventional communication platforms, the integration of HR technology enables the timely identification of issues across various departments within the

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organization. This integration also facilitates the generation of reminder reports, aiding managers in problem identification and fostering departmental collaboration to ensure the smooth functioning of work processes.

- "We have an online communication platform connected to our company mobile app and can help employees get some help online and even chat about topics outside of work. Of course, we set up the platform to be dynamic and better help employees adapt to their jobs. More than 6,700 employees have registered on the platform, and we believe that with the help of the online platform, we will be able to carry out more efficient communication and work." (interviewee 4)

4.4. Talent Management

Implementing HR technology has been beneficial in enhancing the company's personnel management strategy. In conventional talent management systems, organizations must thoroughly evaluate and assess several pieces of information pertaining to an individual, including their curriculum vitae and job description, to ascertain the appropriateness of job placement and associated perks [18]. The procedure is characterized by a significant investment of time and financial resources. Integrating artificial intelligence systems can facilitate the streamlining and enhancement of organizational processes. These systems can effectively identify and allocate suitable candidates for specific roles while also assisting companies in devising optimal working conditions, environments, and benefits to ensure the contentment of their talented workforce [19]. Additionally, the system can offer skills training and implement intense training programs for individuals. On one side, the training can facilitate the rapid comprehension of the company's culture and the tasks associated with the job. Conversely, the training to enhance skills can also assist those with talent in developing their potential work-related abilities or augmenting their overall work proficiency and fulfilling the company's present and anticipated future growth requirements [20]. By employing algorithmic analysis and intelligent software production, the training courses can be updated to align with the evolving requirements of the firm at various stages. Consequently, these courses can replace conventional in-house training, representing a novel approach to talent development programs.

The Learning Management System (LMS) is an emerging e-learning platform that integrates artificial intelligence systems to streamline the administration, monitoring, documentation, and implementation of an organization's training or skills enhancement initiatives. The system can be tailored according to the organization's present strategic goals, the required competencies, various work settings, and the specific nature of tasks. Additionally, it produces periodic reports to offer users feedback on their progress and course completion. The company's managers can frequently monitor their employees' learning progress, including tests, overview reports, and other relevant information. They can then utilize the recommendations provided by the system to allocate and oversee the talent inside the organization effectively. One notable benefit is the potential for substantial cost savings in training expenditures for the organization. Additionally, utilizing an online training platform enhances the flexibility and autonomy of the training process. Furthermore, regularly updating content within the program ensures that the learning materials remain up-to-date. It guarantees the program's extensibility and promotes new training approaches. Indeed, it serves to enhance the aptitude of those with exceptional abilities. Nevertheless, the implementation of such a training system presents some obstacles. These challenges encompass the extent to which employees' online training proficiency can adequately align with the demands of offline work, the assurance of a satisfactory learning experience for employees, and the degree to which they can fully embrace the online training system. Hence, the utilization of the system is currently in its nascent stage and necessitates adaptation in alignment with the company's perspective objectives and the advancement of the artificial intelligence system.

- "Our company has a dynamic learning system where we regularly put up company learning materials on understanding the company culture, company strategy and goals, company values, consulting services, investment services, etc. It is based on the different needs of different departments so that people from different departments can tap into our specific learning modules

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> to learn and strengthen their competencies... Although we have not fully developed the system yet, and we intend to put in place some future directions of the company and even the status of the positions in the branches, I always believe that this system will help us to train the right people to adapt to our development." (Interviewee 5, 6)

4.5. Risks and Fairness

The application of HR tech technology and the development of artificial intelligence systems contain internal and external issues regarding the organization's human resource management process [21]. The following issues regarding the risks are summarised through observations from the University of Melbourne's Open Course in Management.

Firstly, internal risks mainly include the regularity of internal data usage, personal privacy issues of employees, and systemic risks. Problems with internal data use include, but are not limited to, data leakage, data overload, data saturation and misuse by managers, and data expiration beyond repair. Employee privacy issues include the invasion of employee privacy during managerial supervision, reduced work freedom, and employee discomfort and resentment due to dynamic supervision. Systemic issues include software application problems, maintenance, departmental collaboration, departmental guidance and training, and software crashes and jams while using AI systems. These problems will impact the company's normal human resources management process, reducing management accuracy, ignoring employee satisfaction, and adding psychological pressure on employees. Adding a new system may change the working atmosphere and require management to adjust the new system, which is time-consuming and costly. At the same time, HR tech, as a new management model, must be further considered and optimized for the future, which is still a challenge for the company [22].

Secondly, external risks include data security issues, cooperation, and legal risks. External data include data exchanges with suppliers and providers, trade amounts, turnover, and contract generation documents. When these files are uploaded to the direct management cloud system, the security of the data may be interfered with by third-party software, resulting in data loss, or the data may be damaged by third-party plug-ins. The risk of external cooperation is that when a third party signs a cooperation agreement, the third party may doubt the system's security, stability, and resource maintenance and terminate the cooperation agreement. It may affect the company's strategic cooperation, short- and medium-term goals and annual performance. The legal risk lies in the use of the AI system and HR tech data, the lack of appropriate policies to regulate the misuse of the system, and whether the company's adjustments following the new policy can meet the needs of the policy [23].

At the same time, many fairness issues are born out of AI systems' use. Firstly, AI systems allocate human resources based on established computational data, ignoring employee's demands [24]. Therefore, there may be some algorithmic bias problems, leading to employee dissatisfaction. Secondly, there is some controversy about whether the results of the whole system distribution process are reasonable. Managers can adjust the data through their preferences, thus affecting the transparency of management and making employees less loyal. Secondly, the AI system seeks to maximize the company's performance, which may lead to disclosure regarding employee well-being, needs, and special employee care. For example, care issues for disabled employees, cultural differences between different employees, and the special needs of female employees. These are still things that the system needs to learn from and adjust to rather than being "standardized" and "intelligent" at the expense of the employees themselves [25].

5. Discussion

The qualitative findings of our study indicate that AI systems have been utilized within human resource management, specifically in talent recruiting, staffing, and talent management. However, it is essential to acknowledge that using these systems also entails potential hazards and fairness concerns. These issues can be attributed to the inherent characteristics of the AI system, specifically its intelligence and programming. The system prioritizes optimizing efficiency and enhancing work performance while overlooking employees' developmental requirements. Merely relying on HR systems in isolation is

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insufficient; rather, it necessitates the presence of human support systems to acquire knowledge from machines and implement human adaptations.

Integrating AI forecasts with human judgment, commonly called the "human-in-loop" approach, can produce novel concepts for contemporary management approaches. The user's text is already academic. The human-in-the-loop methodology integrates the capabilities of AI with human individuals' expertise to enhance the decision-making process. Within the realm of AI management, this particular technique has the potential to enhance the accuracy of AI forecasts by using the implicit knowledge possessed by domain experts. These experts can offer supplementary perspectives, verify the outputs of artificial intelligence, and progressively enhance the accuracy of AI predictions through their specialized knowledge and experience. Organizations have the potential to enhance the efficiency and efficacy of their decision-making processes, thereby mitigating internal risks and fostering principles of fairness and equity within the organization.

The primary objective of this research is to assist finance managers and professionals in various advanced sectors in gaining a comprehensive understanding of the use of AI technologies in human resource management. Nevertheless, it is essential to note that this report solely relies on qualitative data, without any accompanying quantitative data, to validate the alignment of the adjustments made to the AI system with the requirements of the algorithms. Additional study and optimization are required to validate the viability of the human-in-the-loop approach in meeting future organizational requirements.

6. Conclusion

AI is undergoing rapid advancement and is widely recognized as a general-purpose technology that will significantly impact enterprises. The rise of HR technology organizations presents a novel framework for the administration of human resources. The utilization of AI in the field of human resource management (HRM) has brought to light a multitude of risks and concerns about fairness.

This research examines the utilization of AI in human resources (HR) management and the associated hazards. The interviews showcased in this study shed light on some pertinent concerns. Many financial organizations in the front-end sector have begun to use HR technology for human resource management (HRM). However, it is critical to note that some biases can arise in implementing these applications. Furthermore, integrating novel technology is widely recognized as a complex endeavor for employees, raising concerns about employee contentment and autonomy. The results indicate that exclusive dependence on AI systems for human resource management is insufficient, necessitating the implementation of other pertinent strategies by enterprises to address both organizational objectives and employee contentment effectively.

The study findings demonstrate the efficacy of employing a hybrid approach that integrates expert prediction and artificial intelligence to address challenges organizations encounter in using HR tech technologies. The potential impact of AI on managers is the potential loss of control, authority, and accountability. Managers may exhibit reluctance in delegating decision-making authority to artificial intelligence. In order to effectively tackle these difficulties, it is imperative to do more research aimed at the development of novel "AI application models." Efforts must be directed towards diminishing reliance on AI while including more compassionate designs and options. This measure is expected to mitigate employees' reluctance towards AI and foster a climate of trust, equity, and receptiveness. For managers, it facilitates their engagement in the decision-making process, raises their level of authority, and optimizes decision-making effectiveness. Enhanced AI has the potential to partially address the company's current and future development requirements while also enabling adaptive modifications to support managers in achieving greater effectiveness and efficiency in their management practices.

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