Artificial Intelligence Adoption Factors in Human Resources Management

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Abstract: *In the present world of modern technologies, Artificial Intelligence (AI) is one topic which has been researched in numerous literatures, however, it is evident that almost negligible attention has been bestowed on the study of use of AI in Human Resource Management (HRM). AI is systematically synchronised in HRM in several domain, including hiring, management effectiveness, and compensation. A list of recommendations for implementing AI in HRM has been made. The purpose of this study is to determine the adoption variables for six different AI in HRM scenarios. These scenarios incorporateartificial neural network (ANN) for turnover expectation, Search engine based on knowledge for finding suitable candidate, geneticcalculations for preparation of the staff roster, mining of content for HR analysis of opinion, procurement of data from resume for extraction of data, and interactive voice reaction for representative self-service. Thus, elements that influence the adoption of AI in HRM include vendor partnerships, government participation, complexity, managerial support, compatibility, and relative advantage. By analysingadoptiondecidingfactors, this researchaimsto providenewinsights for professionals and researcherswhiledecreasing the dangersrelatedto AI selection in certain HRM domains.*

Keywords: *AI, HRM, AI adaptation Factors, ANN, Text Mining*

Introduction

In the changing world of modern business, HRM plays a pivotal role in shaping organizational success (Farndaleetal.,2023)[15].When businesses struggle with the challenges posed by a rapidly changing global economy, artificial intelligence integration has emerged as a transformative force in human resource management (Dauvergneet.al.,2022)[11].AI in HRM is being adopted because it can help HR managers make more accurate, efficient, and strategic workforce management decisions Rodgers et.,(2023)[47]. Digitalization, cloud computing, and intelligent software have already revolutionized the way departments operate in practically every kind of business, with HRM being a prime example. Artificial intelligence (AI) is currently regarded as the HRM technology advancement of the highest level (IBM,2020). These technologies are making it easier to implement deep learning, machine learning, and big data analysis in the HR department, which is improving HRM effectiveness (EY,2020).

The application of a certain amount or level of intellect by a machine or a computer in performing the allotted work is known as AI (Nilsson,2014)[42]. It depicts a machine that has

been trained to think and act like a living person. Wang & Lin (2018)[61] simplifiedartificialintelligence as a concept of a computer program or framework that can recreatethe intelligence of humans. The literaturedepicts HRM to be associated with AI as a work of human-computer association and interaction that improvesefficiency and effectiveness in management to progressin different processor its demarcated functions for gathering, protecting, and establishing employee information (Bhardwaj, Singh & Kumar,2020) [7]. It may be furtherstatedthat is a type of HRM software that can make data-driven plans to focus and in alignment with the operation of the HRD (Bataineh,2017)[6]. In conclusion, the execution of AI in HRM has come aboutwithin the enrolment of these data in recruitment, selection, performancemanagement, remuneration, and talentacquisition Management (EY,2020).

It is widely acknowledged that AI plays a significant role in Human Resource Management (Wang & Siau, 2019)[61]. This is supported by research conducted by Lengnick-Hall, Neely & Stone (2018)[32], who suggest that companies, corporations and organizations can leverage AI to improve their hiring process by creating job descriptions and gathering and analysing candidature data from various avenues. Moreover, a variety of e-communication ways could be used to characterize and get in touch with possible candidates for an interview (Zhu, Corbett & Chiu,2020)[63]. In addition to the previously mentioned benefits, AI technologies provide the ability to perform online video interviews with prospective applicants, analysing their interactions, attitudes, and body languagetoidentifypeople whowouldbeabetterfit for an companies/concerns/organisations requirements (Vinichenko,et al.,2019)[59].Every such tasks can be accomplished without interference of Human. One more illustration of the benefits of utilizing AI in HRM is the examination of employeebehaviours, attitudes, and feelingsthat may have an effect on execution of his job allotted (Todoli-Signes,2019). Consequent of such kind of probemay improve the likings of the organisation staff, i.e. satisfaction of the employee and efficiency (Todoli-Signes,2019). The benefits of utilizing AI in HRM may well beexpressed on a never-ending list. AI applications in part, in HRM is still in thenascentstageand yet to betried out or assessedin the commercial sector. Companies are using AI in HRM, but reasons for doing so are unclear. AI can streamline processes, reduce bias, and help make uniform decisions. Consider using AI to improve your HR practices and stay ahead ofthe competition. (Lengnick-Hall, Neely & Stone,2018)[32]. This study's overallobjective is to find and analyse the factors which needs to be adopted that support AI in HRM. The current body of research has been examined in Google Scholar, Emerald Insight, and Elsevier ScienceDirect in orderto achieve this. Studiesparticularlylooking at AI's work in HRM have been chosen for analysis. It is crucial to highlight the dearth of research evaluating AI technology in HRM or examining success variables that influence HRM's adoption of AI. Thus, this study provides a framework for investigating success aspects that influence HRM's adoption of AI. As illustrated in Figure 1, in order to accomplish this, we employ a standard process that looks at adoption s factors of success affecting AI (Chen, 2019)[10] and AI scenarios in HRM (Strohmeier and Piazza, 2015)[54]

Compatibility, relative advantage, complexity, managerialsupport, government involvement, and vendor collaboration are among the successaspects that have been particularly taken under consideration.Regarding the applications of AI in HRM, these includegenetic staff rostering, knowledge-based searchengines for candidate finding, artificial neural networks for turnover forecast, and algorithms, content mining and estimationanalysis for HR, data extraction from gathering of data from resume, and interactive voice response for employee self-service. This study is based on the earlier work of Chen (2019)[10] and Strohmeier and Piazza (2015)[54], although more variables or scenarios could be included. Subsequently the research

question raised will be addressed during the model-development process: What are the factors that influence AI adaptation in HRM? The model (Figure 1) will be put to the test by verifying data from databases that are specifically dedicated to AI and HRM.

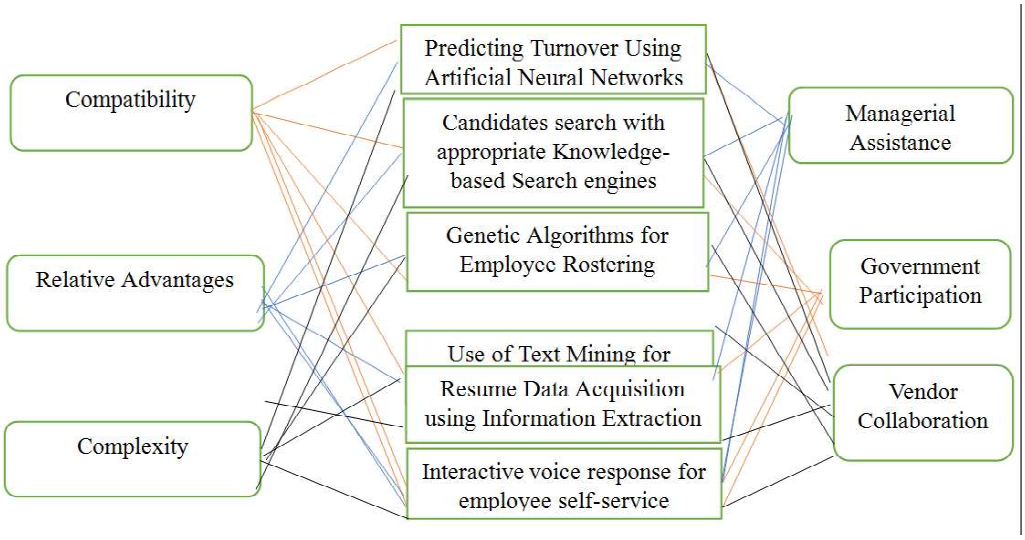

Figure 1: Success Factors for adopting AI in HRM Scenarios

Source: Author

Methodology

The study aims to combine two distinct research streams in order to gather information and spot trends in the factors for adoption of AI in HRM. It is pillared on a narrative literature review (Rzepka & Berger,2018) This paper's first section establishes the theoretical framework for artificial intelligence by outlining its conceptual framework and its fundamental components.

AI scenarios for HRM are covered in the second section. The relationships between adopting Scenarios and factors are developed in the third section. In other words, it investigates AI adoption factors in HRM contexts.

Discussion

The Concept behind the Framework of AI and its Building Units.

One of the most ambitious dreams nowadays is artificial intelligence (AI), in which individuals need to construct a machine that can think, reason, and learn like a human. As a result, AI seeks to replicate human thinking processes in domains where technology assist like understanding, perception, or decision (Lexcellent,2019)[33]. Due to quick propels in advancement and innovation, the definition of artificial intelligence has advanced over time (Kok, Boers, Kosters, Putten, & Poel, 2009)[30]. The Illustrated Oxford Dictionary (2003) defines artificial intelligence (AI) as the refinement and upgradation of computer system that can perform fulfil the achievement requiring human intelligence, such as deciding, making of decision and recognizing of speech. According to Wamba et al. (2020), artificial intelligence refers to computer systems or machines that can learn to fulfil the allotted works typically require human intelligence. More comprehensive meanings of artificial intelligence (AI) include, approaches and understandings that AI applies and integrates into other disciplines, including computer science, operations,investigation, psychology, philosophy, neurology, cognitive science, linguistics, control theory, probability, and rationality and optimization (ScienceDaily, 2020).

To have a scientific understanding of artificial intelligence, we must examine its constituent parts. Boisseau & Wilson (2019)[9] assert thatMLandDL are the fundamental components of AI.ML is a type of computer program that the developer or the programmer has not developed or programmed but the outcome is of such. Machine learning algorithms use data to create and improve rules, and then the computer decides how to reciprocate it has learned from the data. The main aspect of machine learning is that it allows data to direct the development of rules and algorithms. (Boisseau & Wilson, 2019; Joshi, 2020)[9]. DL is a subset of ML that was developed to assist machine learning algorithms in achieving their intended objective (Guo et al., 2015). As stated by the 2017 PWC Worldwide AI Study, AI will have a strong impact on the GDP of each nation by the year 2030. By 2030, China is expected to contribute to 26.1% of the global GDP. North America will follow at 14.5%, while Southern Europe will account for 11.5%. Developed Asia is projected to represent 10.4%, Northern Europe at 9.9%, Africa, Oceania, and other Asian markets at 5.6%, and Latin America at 5.4%. AI will become a driving force in every department of companies, including HRM. (Harvard, 2017;Stanley & Aggarwal, 2019)[19]Research in AI, ML, and DL has diverse applications in human resource management (Rocabert, 2017)[48].These apps cover a range of functions that include performance management, performance evaluation, recruiting, and selection, according to EY (2020). For example, chatbots with human-like reactions and customized expressions are created using natural language processing (NLP), as noted by Kocaleva, Stojanov, Stojanovik, & Zdravev (2016)[29]. One potential application of deep learning in HRM is the use of chatbots for recruiting and selection (Nawaz & Gomes, 2019)[41].

Applications of AI in HRM

Human workforce is commonly regarded asorganization's one of the most valuable resources (Markoulli, Lee, ElizaByington, & Felps, 2017)[38], and handling them well is seen as abasic responsibility of the Management for accomplishing long-term success (Armstrong, 2016)[4]. To successfully manage and complete duties, as also to move forward or at the least assess the performance of the employees, HRM and upgraded technology are important (Bataineh, 2017)[6]. AI is among the most current technologies with the most potential in HRM (Bhardwaj, Singh, & Kumar, 2020)[7]. There isn't much academic research on the utilization of AI in HRM. Our research is based on prior findings by Strohmeier and Piazza (2015)[54]. They looked at six AI situations where it can be applied in ANN for turnover prediction and candidate search, utilizing genetic algorithms for preparing roster of the staff, resume data gathering with data extraction, sentiment analysis with content mining, knowledge-based search engines, and interactive voice response for employee self-service. They are all related to HRM strategies. The consequent subsections give a more in-depth analysis of them. Turnover Predictions with Artificial Neural Network Systems: ANNs are computational frameworks that connect a few CPUs with numerical models that differs from each other (Walczak, 2016). ANNs offer a wealth of data to for improvement and ease of decision-makingby the Management (Tkac & Verner, 2016), in expansion to helping with related duties and obligations an illustration of an ANN's utilize in HRM is the forecasting of employee churn (Strohmeier & Piazza, 2015)[54] Turnover of the employee refers to the resignation of workers voluntarily for non-work-related causes. Historic employee information, including age, seniority, salary, qualifications, job, gender, and family concerns, may be associated to these causes. Employee data-driven ANN could identify extremely intricate patterns that influence employee turnover. This forecast is crucial for the company, particularly when it comes to high-performing workers, as it may help to prevent turnover or at the very least prepare it for the need to replace staff members more quickly. As a result, they could continue to produce in a market with intense competition.

Searching for candidates using search engines which are based on knowledge:

Engines which are used for searching and based on knowledge are tools that are able to make out queries within web content and then apply that recognition or knowledge to help users refine their search queries in real time by organizing search results in a particular way (Otegi, Arregi, & Ansa, 2015)[44]. Consequently, they both work to decrease the amount of time spent and also raise the representation of understanding about the inquiry. A knowledge-based search engine application scenario in human resource management is seeking candidates (Strohmeier & Piazza, 2015)[54]. Selecting the best applicant is a difficult task. Employers used to spend a great deal of time and energy filling open positions. Compared to the number of applicants actively pursuing a position, the bank of qualified candidates are exponentially bigger accessible roles. More inclusive and efficient search results are attainable when the full pool of potential candidates is efficiently searched. Therefore, scheduling interviews or streamlining the application process might be made easier by utilizing AI to evaluate resumes and incorporate candidature data in the hiring process. Thanks to this technology, which provides reasonable facts about potential applicants, elements of the recruiting and selection process could be automated (Luger, 2005)[35].

Utilizing Generic Algorithms for Staff Rostering:

According to Shukla, Pandey, and Mehrotra (2015)[51,52], algorithms which are genetic are used for solving problems strategies influenced by bio-tech that decide an individual's goodness. Genetic algorithms deliver solutions based on a given function linked with objective and specific issue criteria limitations (Esch, Franklin, Dark, & Harder, 2020)[12]. Staff rostering is one situation where genetic algorithms are used in HRM (Strohmeier & Piazza, 2015)[54]. By combining task needs with employees' physical and mental capacities, staff rostering finds the best tasks for each worker (Ijjina & Chalavadi, 2016)[25]. The resulting problem which has been optimized is characterized by numerous limitations of specific domain, such as working beyond time limit to the maximum,time for recreation, and required qualification, among others. It too considers numerous issues, considers costing, the person fit for the job, and preferences of the employee.

Using Text Mining Sentiment Analysis:

Text mining approaches include functions such as text categorization, summarization, topic recognition, extraction of idea, retrieval of the items searched, and clustering of the documents (Hashimi, Hafez, & Mathkour, 2015)[20]. According to Kaushik and Naithani (2016)[28], title identification and tracking as well as content summarizing from pre-defined categories play many roles in enabling functionalitythroughout the organization's divisions. Sentiment analysis represents a particular use of text mining in HRM (Strohmeier & Piazza, 2015)[54]. Understanding how managers, employees, and HR stakeholders feel about HR-related issues provides useful information for identifying strengths and Problems in HRM-related. These thoughts and feelings are being spoken more and more on blogs, employer evaluation websites, and social media. Relevant elements that might be included in this kind of sentiment analysis include leadership style, career opportunities, employee satisfaction, pay ratios, and training quality. Decision-makers mightbe assisted in their short- and long-term planning by using interactive e-platforms to identify opinions and attitudes on particular issues. These tools can aid HRM stakeholders in forecasting and predicting future moves (Akilan, 2015)[1].

Resume Information Extraction and Data Acquisition

The primary goal of information extraction (IE) as is evident from the term is to take data structured datafrom unstructured or semi-structured data (Nasar, Jaffry, & Malik, 2018)[40]. Resume data gathering is one application scenario for Internet Explorer in HRM (Strohmeier & Piazza, 2015)[54]. The department of HR edits a large quantity of resumes in text document format during the hiring

process. To proceed with the hiring process, these text documents must first be analysed by humans. After that, pertinent information must be manually retrieved and uploaded into HR information systems. It could be performed in automode using Internet Explorer by collecting relevant information from a resume, including the applicant's name, address, job titles, duration of employment, previous employers' names, qualifications, and so on. This would eliminate the need for human intervention in systems that manage HR data (Moreno & Redondo, 2016). The faster processing of applicant data reflects this and presents an opportunity to reduce associated costs.

IVRfor Employee Self-Service.

The goal of interactive voice response is to increase voice communication between people and computers (Howell, Harrison, Burris, & Detert, 2015)[23]. Several departments have already used voice-based interactions between people and computers including marketing, HRM, and customer service (Hildebrand, et al., 2020)[21]. Interactive voice response can be utilized in HRM for various purposes, and one of the application scenarios is employee self-service. (Strohmeier & Piazza, 2015)[54]. The purpose of Employee Self-Service (ESS) is to shift technology-based HR tasks from HR specialists to employees themselves. ESS primarily deals with offloading specific responsibilities pertaining to operation like updating personal information, modifying benefits, enrolling in training programs, and monitoring employee performance. These services provided by HRM staff members to HRM stakeholders result in increased efficiency gains (Vardarlier & Zafer, 2019)[57]. Voice bots which can converse with employees to solve and comprehend their problems and provide guidance to get the best outcomes, are another use for IVR (Evseeva, Kalchenko, Evseeva, & Plis, 2019)[13]. Selected cases have demonstrated their applicability in AI implementation for human resource management. These allow companies to use AI to enhance the results of particular HRM functions (Finlay, 2017)[16]. According to Lennick-Hall, Neely, and Stone (2018), the question at hand is, which are the effective adopting criteria to utilize the advantages of AI in HRM? The following segment aims to elaborate on the response to this query.

AI Adaptation Factors in HRM Scenarios

Artificial intelligence has the potential to bring significant advantages to organizations, but it also carries risks. If organizations fail to develop a comprehensive framework for successfully utilizing AI components, it can turn an active situation into a passive one (Lennick-, Heinrich, Janiesch, & Zschech, 2020). Achievement Factors are one of the most essential facilitators that make AI installation successful. These elements are crucial in raising the likelihood of success for those making decisions. Numerous success criteria exist for each technological application however, this study is based on Chen's earlier research (2019)[10]. This study has analysed six success factors that can impact the implementation of AI in HRM. The following factors are important to consider apart from others: compatibility, relative advantage, complexity, managerial support, government involvement, and vendor partnership.

According to L.L. Chong & Olesen (2017)[31], compatibility is the degree to which innovation and technology can satisfy the needs of potential adopters while also offering value and experience. Previous studies have shown that compatibility is beneficial not only for AI but also for the adoption of IT in general (Verma & Chaurasia, 2019; Gangwar, Date, & Ramaswamy, 2015)[58,17].

Comparative or relative advantage, on the other hand, refers to the perceived value that a technology offers (Pillai & Sivathanu, 2020)[45]. The adoption of AI is significantly impacted by relative advantage, according to the literature (Mahesh, Vijayapala, & Dasanayaka, 2018; Binsawad, Hawryszkiewycz and Sohaib, 2019)[36,8].

Complexity is the degree to which technology is thought to be comparatively hard to use and understand (Manson, 2001)[37]. The literature

explains the function of complexity as a form of relative advantage and compatibility. Studies have shown that AI technology adoption rates may increase if its complexity is reduced (Lu, Luo, Wang, Le & Shi, 2015)[34]. Otherwise, it can be said, the simpler it is for organizations to install and integrate AI in their business operations, the morelikelihood for it to be adopted.

Support from the management and managers isone more crucial factor that influences the adoption of AI. Literature suggests that it significantly affects approach towards AI adaptation (Awaigah & Lim, 2015). Furthermore, it is also necessary to encourage the adoption and adaption of technologies that bring about significant changes for end-users (Obal & Morgan, 2018).

The fifth important factor influencing the adoption of AI is government policy and involvement. According to Alsheibani, Cheung, and Messom (2018), laws and policies can promote the spread of artificial intelligence. Laws can also reduce or even eliminate obstacles to the introduction of new IT systems. Furthermore, Halaweh (2018) notes that the process of adopting new technology is complicated, and policies ofthe government may serve as a catalyst to simplify it.

Regarding vendor partnerships, they can be defined as tasks or activities that, in the absence of internal technical expertise inside the organization, are delegated to a service provider under the terms of a formal contract (Alghamdi, 2020)[2]. Therefore, cutting the expenses of managing and sustaining technological assets while raising the Caliber of the advancements is the primary goal of technology and innovation vendor partnerships. This facilitates the adoption of new technologies by non-tech organizations by utilizing their core competencies (Jain and Khurana, 2016)[26]. Collaboration both within and between organizations helps businesses gain a competitive edge (Ali & Khan, 2016). Subsequently, one of the best ways to extend the rate at which modern advances are received effectively is through vendor partnerships. In particular, many businesses are still inexperienced with AI advances,AI to be adopted in enterprises is typically connected to IT suppliers and cooperative partners (Hong, Ling, & Yong, 2020). Vendor partnerships are a key component of the AI adaptation segment and have been scientifically considered as one of the fundamental determiners for innovation adoption (Chen, 2019).

Conclusion & Future Research

Competent Authorities within the HR department who are apt for decision making find it troublesome to tailor any AI technique to specific HRM tasks since it necessitates an in-depth understanding of both AI and HR (Strohmeier & Piazza, 2015)[54]. Thus, primary objective of research is to identify a workable paradigm suitable for a company looking to effectively implement AI applications and innovation in pin-pointed HRM situations. The study's result illustrates that the factors analysed for AI selection had a direct impact on the HRM scenarios. Compatibility, relative advantage, complexity, managerial support, government participation, and vendor partnership are the selection variables that are taken under consideration. On the other hand, artificial neural networks are used to predict employee turnover; knowledge-based search engines are used for candidate finding; genetic algorithms are used for staff rostering; text mining is utilized for sentiment analysis; resume data extraction is utilized for information extraction; and interactive voice response is used for employee self-service. As a result, based on earlier research, this paper examines and clarifies the adoption determinants of AI in particular HRM settings. We leave it for future research to examine in more depth, using the paradigm described in this paper, how AI is being applied in large corporations. There's also the intriguing question of whether execution varies depending on the company sector or geographical areas.

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