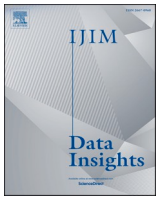
International Journal of Information Management Data Insights 4 (2024) 100208

Contents lists available at ScienceDirect

International Journal of Information Management Data Insights

journal homepage: www.elsevier.com/locate/jjimei



The adoption of artificial intelligence in human resources management practices

Nishad Nawaz [a,*], Hemalatha Arunachalam [b], Barani Kumari Pathi [c], Vijayakumar Gajenderan [d]

[a] Department of Business Management, College of Business Administration, Kingdom University, Bahrain
[b] PG & Research Department of Commerce, Sri Kanyaka Parameswari Arts & Science College for Women, Chennai 600 001, India
[c] Department of Commerce (Hons), Sri Kanyaka Parameswari Arts & Science College for Women, Chennai 600 001, India
[d] Department of Commerce, Sir Theagaraya College, Chennai 600 021, Tamil Nadu, India

ARTICLE INFO

Keywords:
Artificial intelligence
Human resource management practices
Automation
Accuracy
Computing power & capacity
Real-time experience
Personalization
Time-saving & cost reduction

ABSTRACT

This study explores the impact of Artificial Intelligence (AI) on Human Resources Management Practices. By focusing on key outcomes such as accuracy, automation, computing power & capacity, real-time experience, personalization, and time-saving & cost saving. The research aims to identity the potential benefits of AI adoption. Data from 274 IT employees in Chennai City is Collected through a well-structured online questionnaire. Using IBM SPSS version 21 software and AMOS version 21 is used for analysis, the study proposes a novel research framework. The findings indicate that variables like Accuracy, Computing Power & Capacity, and Personalization significantly influence Time-Saving & Cost Reduction, while Automation and Real-Time Experience do not. The novel contribution of this study lies in its exploration of the specific outcomes of utilizing AI Technologies in Human Resources Management Practices. By focusing on key variables such as Accuracy, Automation, Computing Power & Capacity, Real-time experience, Personalization, and Time-Saving & Cost Saving, the research provides a comprehensive understanding of the expected outcomes when implementing AI in Human resources Management and the relationship among those outcome variables.

1. Introduction

After almost sixty years of evolution, Artificial Intelligence has become ubiquitous over past two decades (Morgenstern et al., 2021). AI technologies have begun to consistently grow and gain considerable prominence in almost all the fields, including medicine, engineering, agriculture, organizational management, tourism, transportation, and so on (Mintz & Brodie, 2019) and have entered both the public and business environment (Haenlein & Kaplan, 2019). The AI applications and technologies prevailing today are not a worldwide recipe; instead, they act as a workshop with many tools for performing different functions and tasks. These tools are presented in the form of some software or gadget with accessible user interface possibilities and are well-developed and designed. It is vested in the hands of the individual (knowledge engineers or AI developers) to select the right tools and use them in a sensible way appropriate to the task to be performed (Ertel, 2011). So, from the discussion mentioned above, AI will shift a regular part of our regular lives very soon, like the internet and social media. When it comes to the definition of the term AI, Kaplan, in his paper "A Brief Chronicle of AI: On the Present, Past, and Future of AI, has defined AI as "a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation" (Haenlein & Kaplan, 2019; Morgenstern et al., 2021).

The fast-paced development of AI would transform people's personal lives and how firms network with their employees and customers. This new technological revolution at its core is disrupting the organizations and workplace. Technological innovations like AI are transforming the workplace and changing when, how, where, and by whom the job should be done (Ravin, 2017). Industries are undergoing significant digital upheaval, with a prominent shift towards the integration of AI in decision-making processes to ensure the success and growth of companies (Varsha, 2023). Organizations are compelled to upgrade their organizational functioning and develop their human resources' skill sets to achieve optimal company performance (Wiradendi Wolor, 2020). For quite some time, companies have started to recognize the inevitability and significance of AI in managing human resources to survive the rapidly changing environment and outshine amidst tough competition

* Corresponding author.
E-mail address: n.navaz@ku.edu.bh (N. Nawaz).

https://doi.org/10.1016/j.jjimei.2023.100208

Available online 20 January 2024

(Waheed et al., 2019). Since AI has penetrated almost all fields and gained a great deal of attention, researchers are now focusing on constructing strategic human resources management practices backed up with AI technology (Wang et al., 2020). Organizations all over the world are faced with challenges to shrink costs and save time, and now it is identified that the combination of technologies similar to the Internet of Things, Machine learning, and AI in the management process as a strategic element can help to tackle these challenges (Hemalatha et al., 2021). Undoubtedly, AI has a hopeful future in Human Resources Management; however, integrating AI in HR processes involves challenges like AI can work efficiently like a human being only when provided with quality data and chances that the confidential documents and policies shared by the organizations may be misused.

Despite these AI-related challenges, companies are still showing interest and putting significant effort into incorporating AI in HR functions because the benefits of using AI in HR overshadow the observed challenges (George & Thomas, 2019). Organizations can enjoy AI's total benefit and potential if they are prepared to transform their workers to work with intelligent machines efficiently. This process undoubtedly will be time-consuming, but the benefits will be enormous (Mathipriya et al., 2019). During the lockdown situation and the crisis created by the COVID-19, the HR of the organizations did not concentrate on performance; instead, they focused on agility, resilience, and bouching back. According to the qualitative research done by Boston Consulting Group Survey 2020, although the productivity level was maintained during the pandemic, executives were more concerned about the employees' stress level and well-being. The crisis triggered digitalization, and HR functions rapidly transformed to a digital and automated platform-almost all phases of HR functions starting from hiring, onboarding, performance appraisals have been reinvented in the digital realm (Minbaeva, 2021). AI applications enhance the HRM functions by boosting their efficiency and effectiveness, leading to improved employee experience and better facilitation of performance within organizations (Garg et al., 2022).

When it comes to AI in HRM, AI technologies offers promising solutions, from automating repetitive teasts to enhancing HR processes with neutralized biases. As AI continues to transform workplaces, organizations are recognizing the need to upgrade their HR practices to achieve optimal performance and survive in the competitive landscape. At this juncture, although we have a theoretical familiarity with concepts like AI, Automation, and Robotics, research on the application of AI in the management of organizations is deficient. As a profession, Human Resources management is confronting several disruptions; both academics and HR practitioners need to pay attention and reframe the HR procedures. (Minbaeva, 2021) stressed that as a field of practice and research, HRM shows insufficient fine-tuning. Even though organizations realize that AI can cut down time and effort by the HR manager, by freeing up time and resources that can be strategically enhancing the overall productivity of the organization (Meshram, 2023), organizations do not have a comprehensive understanding of these intelligent technologies and the impacts of utilizing those technologies in HRM at an organizational and specific employee level (Vrontis et al., 2021). Embracing the AI workspace can lead to improved employee satisfaction, better work-life integration, and enhanced overall productivity (Malik et al., 2021). There comes a need for a better understanding about the expected outcomes of deploying AI in HRM and relationship among those outcomes.

Therefore, this study aspires to analyze the academic inputs regarding the utilization of AI technologies in Human Resources management, identify the potential outcome and the influence of outcomes on each other. Hence, the research question guiding the study is

1) What are the potential outcomes of adopting AI in HRM?
2) Does the expected outcomes variables are influencing each other.

The research questions brings the novelty of the article to know whether using AI in Human resources management results to Accuracy, Automation, Computing Power & Capacity, Real-Time Experience, and Personalization (Causal variables) in the functions of the Human resource and, also to find out whether the above mentioned five outcomes of using AI in HRM leads to Time Saving & Cost Reduction (outcome variable) in Human resources functions in Selected IT companies in Chennai City. As a contribution, the research seek to inform both the professions and academic community with insights of potential outcomes of using AI in HRM and the outcomes may lead to Time Saving & Cost reduction.

To address the research question, the study will delve into the literature review on AI technologies in HRM, exploring their outcomes (Section 2) following the Introduction (Section 1). Based upon the extensive literature review, the study also present a conceptual framework diagram, illustrating the relationship between the potential outcomes of adopting AI in HRM. Further, in the Methodology part (Section 3) the study aims to test hypotheses about the relationship among the potential outcome variables based on previous findings, theory or both. The result part (Section 4), and discussion (5) will attempt to clearly understand the expected outcomes of incorporating AI technologies in HRM and shed light on the relationships among the outcomes. The paper dismisses with a conclusion (Section 6) and ideas for further research studies.

2. Literature review

2.1. Role of AI in HRM

The role of AI in Human resource management has been steadily increasing, transforming the way HR processes are carried out almost in all key areas of HRM. Due to the substantial volume of data related to organizational operations, workforce management, AI has been increasingly integrated into various operational HR procedures. This integration aims to bolster sustainable business frameworks, as noted by Votto et al. (2021). The adoption of AI in HRM facilitates easier access to highly skilled individuals for organizations, leading to efficient recruiting process (Meshram, 2023). The intelligent AI technologies offers a fresh approach to personnel management enhancing overall company performance and presenting diverse opportunities for performance management (Khaled et al., 2023) and (Hemalatha et al., 2021). AI-based training enables organizations to evolve into knowledge-driven entities capable of catering to personalized training needs and enhancing the quality of learning (Chen, 2022). The growing adoption of AI in HRM is driven by its ability to generate value for customers, employees, and organizations alike (Chowdhury et al., 2023).

2.2. Potential outcomes of artificial intelligence technologies in HRM

2.2.1. Accuracy

It has been an up-and-coming trend of using AI technologies in Human Resources management for the last two decades. Studies have found that AI provides promising solutions for human resources people, starting from screening applicants to the employee retention stage by taking over time-consuming and repetitive tasks of HR team, enhancing the quality of the HR processes with neutralized biases (Hmoud & Várallyai, 2020).

2.2.2. Automation

Organizations are using AI technologies to automate their repetitive tasks and help in intricately planned decision-making more precisely through extrapolative algorithms (Parry & Battista, 2019). Machine learning technology can predict the future and detect problems more accurately than humans. AI will undoubtedly outperform humans in applicant selection when it comes to the hiring process. Moreover, it can also overcome certain biases often present in the hiring process. AI can reduce human errors and risks and give the best results accurately. Chances of mistakes or errors are almost nil, and AI can achieve greater

precision and accuracy. AI technologies do have optimistic outcomes, i.e., time-saving, cost-effective, accuracy, bias-free, and reduced workload (Hemalatha et al., 2021). The recent advancement in AI has enabled the automation of systems to experience a complete conversion (Agostinelli et al., 2020). Integrating the Natural learning process with deep learning algorithms produces remarkable outcomes like the translation of speeches or text of human language, extraction of insight from human language, and automatically generating content from natural language (Bongarzoni & Marturano, 2020). AI has benefited the HR people by automating administrative and rhythmic tasks (Vedapradha et al., 2019). There are a lot of administrative-related works for HR people which are essential, as well as redundant in nature, like job posting, sourcing, screening, arranging interviews and meetings, preparing schedules and timesheets, recording and verifying accounts, and so on (Baggio & Omana, 2019; Langer et al., 2019; Nawaz & Gomes, 2019; Niehueser & Boak, 2020; Nocker & Sena, 2019; Savola et al., n.d.). Suppose all these tasks can be automated using AI. In that case, it will enormously benefit the HRs by relieving them from routine work and committing more time to creative and strategic thinking and decision-making (George & Thomas, 2019). AI automation enables the job to be fragmented into discrete responsibilities that can be delivered efficiently by several means, from mechanics to devices (Ravin, 2017).

2.2.3. Computing power & capacity

The modernized businesses pact with a tremendous volume of data and information, and the companies must transform themselves intelligent and creative utilizing technology like AI (McCarthy et al., 2019). AI is deliberately designed with the purpose of great potency, profitability and to support humans in reducing their monotonous responsibilities (Khatri et al., 2020). AI and Human resources together can enable managers to monitor human resource configuration in real-time, tap the potential of human resources, which in turn can improve the overall management and work efficiency and helps to realize the high quality and progression of firms (MaWang et al., 2020). The computing power of AI has enabled automation and thereby father analysis of massive organization data with the aid of AI technologies and Big Data (Pillai & Sivathanu, 2020). AI-enabled learning systems can offer individual employees a personalized and customized training program. These are likely to aid an enormous increase in employees' productivity overall and hence help enhance their potential and capability (Iqbal, 2018).

2.2.4. Real-time experience

AI chatbots enable real-time employee engagement and digitization of the HR processes like candidate screening and interviews (Vedapradha et al., 2019). Through means of AI, organizations nowadays can capture and process data in real-time and use that updated information in the decision-making process (Hughes et al., 2019a). AI systems open up the chances for design an automated real-time employee feedback system that can get feedbacks from employees just-in-place, in-time, and hence assists in solving complex problems at the workplace. As such, a real-time system can help augment the learning process and career/-professional development of employees. AI systems can analyze large datasets, both structured and unorganized data, in real-time and discover the formations and designs. It is used for intelligence-assisted human decision-making (De Laat et al., 2020). AI can assist the managers in detecting aberrations by giving real-time comprehension about premature caution signs of severe issues and hence allows them to take timely corrective actions accordingly (Jarrahi, 2018). Real-time interactions ensure efficient usage of resources and services provided, thereby reducing costs (Gopal et al., 2018). The latest technologies, namely Internet-of-Things, are facilitating physical properties to connect to the digital realm, which leads to a vast amount of real-time data (Sivathanu & Pillai, 2018). AI-enabled real-time video interview with applicants across countries helps to pool more enormous applicants and process faster (Thomas et al., 2020).

2.2.5. Personalization

AI can sense, investigate, study, and operate in a personalized approach like a human usually does (Khatri et al., 2020). Organizations are using chatbots to help applicants and employees to provide personalized instructions and support according to their requirements. Nowadays, conventional pay and benefits methods are replaced with personalized packages to meet organizational and individual goals. HR professionals, along with AI, can administer flexible and personalized compensation systems. Moreover, AI can eventually optimize the pay and benefits, reducing employee attrition and increasing employee engagement (Hughes et al., 2019b). AI can indeed facilitate the concept of mass personalization in employee training and development. AI enables the organization to identify the individual needs of the employees and groups of employees and provide training accordingly. AI can offer virtual personal mentors to the employees according to their needs (Maity, 2019). AI-supported systems for estimating real-time assistance for sites using data accumulated to implement personalized suggestions, explications, or options to customer's/employees queries or inquiries, seldom even very complicated problems (Xu et al., 2020).

2.2.6. Time saving & cost reduction

(Sołek-Borowska & Wilczewska, 2018) stated that the AI-based HR processes with a competent and skilled HR team can undoubtedly reap benefits of lessening timespan and reduced costs. The use of contemporary technologies like AI in the HR process ensures the achievement of the given project and allows business enterprises to reduce time and costs. One of the key benefits of using AI in HR is the limiting costs, and ML(Machine Learning) algorithms can actually reduce the risks associated with hiring inadequately skilled/qualified candidates or rejecting appropriate ones and hence reduce costs (Gromov et al., 2018). The organizations aim to implement AI-based automation processes across the HR functional areas, minimizing human effort and reducing the time spent on routine work (Nawaz & Gomes, 2019). Cognitive HR Systems will enable finding and holding talented employees within the organization and building their market advantage at a reasonable cost (Chwastek, 2017). Firms utilizing AI for the recruitment process have realized decreased hiring costs with increased efficiency (Johnson et al., 2020). Using AI in the HRM process simplifies all operations and is cost-effective (Nawaz, 2019). AI always considers the charge of features that are intended in real-time (Ghasemzadeh et al., 2015).

It is accepted that AI has several possible advantages when being executed in HRM. In the opinion of academicians, research scholars, and AI specialists, it is affirmed that technologies of AI do impact the HRM process with inherent results. So based upon the extensive literature review, Accuracy, Automation, Computing Power & Capacity, Real-Time experience, Personalization and finally Time-Saving & Cost reduction are the potential outcome of AI adoption in HRM

3. Theoretical background

The only constant in a world marked by volatility, uncertainty, complexity, and ambiguity is change. Human resource management (HRM) has transformed from performing routine tasks such as recruiting and firing to serving as a business strategic partner. Similarly, the domain of artificial intelligence (AI) has undergone a paradigm shift, transitioning from a simple search tool to the conceptualization and construction of intelligent robotics. AI has evolved into a collection of potent technologies redefining numerous functional areas, including HRM. AI's implementation in HRM is regarded as a positive development because it should generate optimum value at minimum expense. AI focuses on developing tools with discernment and intellect comparable to humans (Kalia & Mishra, 2023). The modernization of Human Resource Management (HRM) has undergone a significant transformation, with the integration of digitization into the laborious processes inherent in how it functions. Human resource management has developed strategies to leverage technological advancements such as the

internet and computers to enhance electronic productivity, cost efficiency, and market competitiveness (Votto et al., 2021). The swift development of Human Resource Information Systems (HRIS) was ignited by technological advancements, which allowed for the infiltration of tactical practices within HR operations with contemporary features such as artificial intelligence (T-HRIS). As it improves sustainable business models, the volume of organizational, personnel, and task-oriented data for which HR is fundamentally accountable has prompted the integration of AI into numerous tactical HR processes (G. M & Suganthi, 2022).

Nevertheless, this progression and expansion of functionalities entails comprehending the present condition of artificial intelligence (AI) in tactical HR procedures. This necessitates HR experts and scholars to delve into extant literature that elucidates AI-augmented HR capabilities and domains for development within the HR field. (Rodgers et al., 2023) point out that Artificial intelligence (AI) can generate real-time decisions by utilizing pre-installed algorithms and computing technologies developed through data analysis. These components autonomously learn and adapt to provide more sophisticated responses to circumstances. Human resource management (HRM), which incorporates the utilization of AI applications and the human element, has the potential to enhance the employee experience within an organization. It is evident that potential outcomes such as Accuracy, Automation, Computing Power and capacity, Real-Time Experience, and Personalization are directly or indirectly leading to the very basic outcome of using AI in HRM, which is Time Saving and Cost reduction. At this juncture, it is important to note that AI-powered recruitment tools can accurately match candidates' skills and qualifications to job requirements. AI-enabled HR analytics can process vast amounts of data with accuracy and provide valuable insights for better decision-making (Malik, Budhwar et al., 2022). Leveraging AI Accuracy in HRM process optimizes various HR functions, leading to time and cost savings while improving overall efficiency and employee satisfaction (Vrontis et al., 2022). AI-powered automation can streamline repetitive tasks that would otherwise require human intervention. These tasks can be performed more efficiently and consistenly by AI systems, leading to reduced cost and faster processing time (Burgess & Burgess, 2018; Malik, Thevisuthan et al., 2022). With high computational power, AI tasks can be executed much faster, enabling quicker results. Increased computing power of AI and cloud computing platforms provide on-demand access to vast resources, allowing organizations to leverage AI capabilities without the need to invest heavily in expensive hardware (Gill et al., 2019; Murshed et al., 2021; Sivathanu & Pillai, 2018). AI enabled real-time information for decision-making, feedback, alteration of course of actions based on progress and responses enables the companies to save time and cost effective. AI real-time features can improve efficiency, cut operational costs, and enhance overall productivity (Achchab & Temsamani, 2021; Rai & Singh, 2023). By utilizing AI personalization in HRM, organizations can create a more engaged and satisfied workforce, leading to improved productivity, reduced turnover, and ultimately cost and time savings (Huang et al., 2023; Modgil et al., 2022).

There are some research previous works done to identify the potential outcome of using AI in Human Resources Management. However, there is no research done to examine the relationship between the outcomes or how each of these outcomes influences the other. Hence, the research gap examining the relationships between outcomes is identified, particularly in selected IT companies in Chennai City, and presented by Diagram.

H1: There is an impact of Accuracy on Time Saving and Cost Reduction in selected IT companies.
H2: There is an impact of Automation on Time Saving and Cost Reduction in selected IT companies.
H3: There is an impact of Computing Power & Capacity on Time Saving and Cost Reduction in selected IT companies.
H4: There is an impact of Real-Time Experience on Time Saving and Cost Reduction in selected IT companies.
H 5: There is an impact of Personalization on Time Saving and Cost Reduction in selected IT companies in Chennai city.

4. Methodology

When it comes to the research design, it is descriptive. The study is designed to identify the outcomes of using AI in HRM practices and examine the relationship among those outcomes. The study is constructed based upon primary data gathered from the respondents, as well as secondary data from various resources like reports, research article databases like Scopus, Emerald, Elsevier, Google Scholar, online open-access journals, etc. were also extensively used in this study to get relevant and up-to-date information in the selected topic. To analyze the potential outcomes of using AI in Human resources management and the relationship between those variables, the researchers targeted the employees of selected IT Companies in Chennai City where AI technologies are used in HRM practices. The opinions of the IT employees are collected through a structured questionnaire, which was designed based on the existing literature. The well-structured questionnaire consisted of the personal and organizational details of employees. Secondly, AI variables (potential outcome of using AI in HRM, namely, Accuracy, Automation, Computing power & Capacity, Real-Time Experience, Personalization, and Timesaving & Cost Reduction) in Likert's five-point scale with options ranging from strongly agree to strongly disagree. The researchers followed the convenience sampling method and collected primary data from approximately 274 IT employees within Chennai City. The online google forms were used to collect data; questionnaire links were circulated via personal contact and social media platforms like Twitter and LinkedIn from May 2021 to September 2021. Out of all the responses received, only 274 were filled completely and correctly,

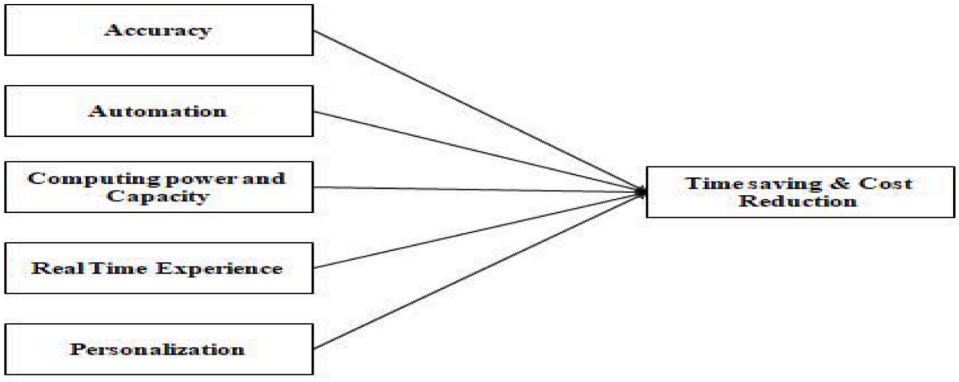


Diagram. Conceptual framework for hypothesis development.

considered for further analysis. For analysis part, IBM SPSS version 21 software and AMOS version 21 software are used.

5. Results

Out of 274 respondents, 55.5 % are female, and 44.5 % are male, indicating that female employees are more willing to take the survey and are more interested in the topic area. The results also stated that the majority, 51.5 %, are in the age group between 26 and 30 years, which denotes that comparatively, young people have taken part in the research survey more enthusiastically. When it comes to educational qualification, it is categorized into undergraduates, postgraduates, and Professionals. It is found that 39.1 % of respondents possess a professional degree, followed by Postgraduates with 35.4 %. The data are collected from IT employees from different designations and levels starting from low to top-level of the management. It is inferred that the majority of the respondents are software engineers with 30.3 %. The results also indicate that 81.4 % of the respondents belong to the married category, and only 18.6 % are single/unmarried. The monthly income of respondents, the majority, 44.2 %, of the respondent's monthly income, is between Rs 25,001–Rs 50,000 and, and 26.3 % of the respondent's monthly income is between Rs 50,001–Rs 75,000. It is found that respondents with 2–5 years' experience have taken part in the survey maximum with 37.6 %, followed by 6–10 years' experience with 32.1 % shown in the Table 1.

5.1. Structural equation modeling

In the realm of sophisticated data analysis, SEM method is particularly favored over traditional statistical techniques as it facilitates the examination of both observed and latent variables, allowing the researchers to unravel intricate causal relationships among various constructs. SEM's capacity to account for measurement errors and its capability to handle multiple variables simultaneously make it a preferred choice for this research as the study seeks a comprehensive understanding of interdependencies among diverse factors. SEM is used to evaluate the model's appropriateness based on the samples collected (R et al., 2012). To analyze the structural model, AMOS version 16 is used. The SEM is considered the most helpful tool for evaluating the causal relationship linking variables and verifying the model's compatibility (Tobbin & Kuwornu, 2011). This integrated methodology allows a holistic exploration of the interconnections between various factors in the context of using AI in HRM.

The above table shows that the estimated P-value is 0.051, which is more significant than 0.05, which denotes that model is fit. Gerbing and Anderson suggest the criteria for an acceptable model were RMSEA of 0.08 or lower; CFI of 0.90 or higher; and NFI of 0.90 or higher (Gerbing& Anderson, 1992). According to Hu and Bentler, the fit between the proposed measurement model and data can be verified with a chi-square goodness-to-fit test, and when the probability value is greater or equal to 0.9, which indicates a good model fit (Hu & Bentler, 1999). The GFI of this research was 0.922, which is more than the recommended value, and the Adjusted Goodness of Fit Index value (0.902) is greater than the recommended value of 0.9, which also represents it is a good fit. The calculated Comparative Fit Index value (0.987) shows that it is a perfect fit, and also, it is found that the Root Mean Square Error of Approximation value is 0.023, which is less than 0.08 which indicated it the model fitted satisfactorily shown in Table 2.

5.2. Measurement model

As recommended by Anderson and Gerbing (1988), we first examined the measurement model and presented the CFA results in Table 3. The below table shows the confirmatory factor analysis results. The confirmatory test result showed a good fit as well. The below table shows the model fit summary of the research model.

The results reveal that the model fits the data well ($\chi^2 = 383.133$; df= 260; χ^2 /df =1.474; Root mean square error of approximation (RMSEA)=0.042; Comparative Fit Index (CFI) =0.97; SRMR=0.071 & Pclose=0.944 provided a good fit of the model to the data (MacCallum and Browne, 1993). The results indicates that the CFA model of adoption of AI in Human resource management variables is fit.

In this research, for all the variables, the square root of AVE exceeds the correlations between variables, thus providing support for discriminant validity of all the variables (Fornell and Larcker, 1981). The square root of AVEs for Accuracy 0.703; Automation=0.730; Computing power and Capacity =0.695; Real Time Experience=0.593; Personalization 0.513; Time saving & Cost Reduction =0.538 and the composite reliability (CR) for all the variables exceeded 0.70 (ranging between 0.800 and 0.915). The average variance extracted (AVE) was found between 0.513 and 0.730, over the minimum acceptable level of 0.50 shown in the Table 3, Table 4 and Table 5.

5.2.1. Hypothesis results

The above table shows that the p values for the constructs namely Accuracy, Automation, and Real-Time experience are less than 0.001, significant at the 1 % level. Hence hypothesis H1: There is an influence of Accuracy on Time Saving and Cost Reduction in selected IT companies, H2: There is an impact of Automation on Time Saving and Cost Reduction in selected IT companies and H4: There is an impact of Real-Time Experience on Time Saving and Cost Reduction in selected IT companies are supported by the study findings. Regarding the variables Computing power & Capacity, and Personalization the P values are not

Table 1
Personal characteristics of employees.

Personal Characteristics	Frequency	*(n = 274)* %
Gender		
Male	122	44.5
Female	152	55.5
Age (Years)		
22–25 yrs	42	15.3
26–30 yrs	141	51.5
31–40 yrs	85	31.0
Above 40 yrs	6	2.2
Marital Status		
Single	51	18.6
Married	223	81.4
Qualification		
UG.	70	25.5
PG	97	35.4
Professional	107	39.1
Income -Monthly		
< Rs 25,000	54	19.7
Rs 25,001–Rs 50,000	121	44.2
Rs 50,001–Rs 75,000	72	26.3
> Rs 75,000	27	9.9
Designation		
Administrator	33	12.0
Business and Program Analyst	43	15.7
software engineer	83	30.3
Project and HR Manager	43	15.7
Managing Director	10	3.6
Others	62	22.6
< 2 years	27	9.9
2–5 years	103	37.6
6–10 years	88	32.1
11–15 years	38	13.9
Above15 years	18	6.6

Table 2
Model fit summary of the structural equation model.

Parameter	CMIN	P	CMIN/ DF	GFI	AGFI	CFI	RMSEA
Outcome	296.13	.051	1.148	0.922	0.902	0.987	0.023

Table 3
Showing the measurement model fit summary of AI adoption in HRM model.

Measure	Estimate	Threshold	Interpretation
CMIN	383.133	–	–
DF	260	–	–
CMIN/DF	1.474	Between 1 and 3	Excellent
CFI	0.97	>0.95	Excellent
SRMR	0.071	<0.08	Excellent
RMSEA	0.042	<0.06	Excellent
PClose	0.944	>0.05	Excellent

significant and hence the hypothesis is not supported.

5.2.2. Confirmatory factor analysis

Relationship among Potential outcomes of using AI in HRM practices (Accuracy, Automation, Computing Power & Capacity, Real-Time Experience, Personalization, Time Saving & Cost Reduction) in selected IT Companies in Chennai City shown in the Fig. 1 and Fig. 2.

6. Discussions

6.1. Discussions on the adoption of AI in HRM practices

The novel theoretical contribution of this research is that we have identified the various potential outcomes of using AI technologies across human resource management practices (Accuracy, Automation, Computing Power & Capacity, Real-Time Experience, and Personalization). Moreover, the research has developed and contributed an integrated model revealing relationship among whether Accuracy, Automation, Computing Power & Capacity, Real-Time Experience, and Personalization cause Time Saving and Cost Reduction in the selected IT companies in Chennai City. The theoretical findings of this study shed light on the impact of various causal variables related to AI adoption in Human Resources Management(HRM) on the outcome variable of Time-saving & Cost reduction. According to the study results, the following discussion was carious out.

The study supports the first hypothesis, indicating that accuracy, as a potential outcome of using AI technologies in Human resources management, leads to significant Time Saving & Cost Reduction benefits to the organization. The study findings suggest that avoiding human errors and being precise in prediction and analysis would help organizations save time and cost in workforce planning and decision-making. AI is simply an intelligent machine that works and tries to react like humans, and its primary goal is to perform tasks done by humans with incredible speed and accuracy (Sugawara & Nikaido, 2014). By leveraging AI's precision in prediction and analysis, HR processes such as workforce planning and decision-making can be streamlined, contributing to overall efficiency.

The study does support the second hypothesis, suggesting that Automation (Causal variable) has significant impact on HRM Practices in the selected IT companies. There are several other studies which are assertive that the AI Automation process does lead to Time Saving & Cost Reduction, this study finding is in perfect line with those findings. This finding totally support the common belief that AI automation inevitably leads to time-saving and cost reduction. Integrating AI in HRM processes yields substantial time-saving and cost-reduction benefits. By automating repetitive tasks such as candidate screening, onboarding, and payroll administration, AI optimizes operational efficiency, allowing HR professionals to allocate their time to more strategic endeavors (Hmoud & Laszlo, 2019). AI-powered analytics enhance decision-making, enabling proactive measures to minimize employee turnover and associated costs (Sahota & Ashley, 2019). Ultimately, the study suggests that AI-driven automation in HRM significantly expedites processes and lowers costs, facilitating a more agile and resource-efficient workforce management (Johnson et al., 2020).

However, in contrary to the above finding, the third hypothesis is not supported by the study results, suggesting that Computing Power & Capacity (Efficiency) of AI technologies has no impact Time-saving and Cost Reduction outcomes in the selected IT companies in Chennai City. While many other studies are optimistic about increased computing power & capacity of using AI in HRM, this study finding is not synchronizing with those findings. The current study findings does not support that with increased computing power, capacity, and advanced memory, AI technologies can take control; even decisions are taken routinely by software systems, resulting in time-saving and Cost reduction (Braun et al., 2016) in human resources management functions (Duan et al., 2019).

The study highlights inadequate computing resources in the IT companies can hinder AI systems from processing data swiftly and accurately, potentially leading to prolonged decision-making processes AD reduced operational efficiency. Insufficient capacity might limit AI's ability to handle complex tasks, resulting in missed opportunities for automating labor-intensive processes and optimizing resource allocation. Such limitations could curtail the anticipated benefits of AI integration, including minimized costs and time saving.

Regarding the fourth hypothesis, the study results support the direct impact of real-time experience on the outcome variable, Time-saving & Cost Reduction in the selected IT companies. The current study results support that the implementation of AI can increase employee experience and engagement towards the organization, which can reduce employee

Table 4
Results of validity measures.

	CR	AVE	MSV	MaxR(H)	A	AUT	CP	RTE	P	TSCR
A	0.904	0.703	0.399	0.908	**0.838**					
AUT	0.915	0.730	0.256	0.917	0.506***	**0.854**				
CP	0.899	0.695	0.276	0.933	0.526***	0.198**	**0.834**			
RTE	0.851	0.593	0.187	0.889	0.416***	0.256***	0.161*	**0.77**		
p	0.800	0.513	0.187	0.842	0.428***	0.239***	0.251***	0.433***	**0.717**	
TSCR	0.851	0.538	0.399	0.871	0.631***	0.465***	0.345***	0.342***	0.264***	**0.733**

Table 5
Model regression weights (variables in SEM analysis).

			Estimate	SE.	CR.	P	Label
TSCR	<—	A	0.422	0.06	7.042	<0.001**	H1-Supported
TSCR	<—	AUT	0.194	0.05	3.887	<0.001**	H2- Supported
TSCR	<—	CPC	0.049	0.035	1.393	0.164	H3-Not supported
TSCR	<—	RTE	0.09	0.044	2.057	0.04**	H4- supported
TSCR	<—	P	−0.025	0.058	−0.425	0.671	H5-Not supported

A: Accuracy; AUT: Automation; CPC: Computing power & Capacity; RTE: Real-time experience; P- Personalization; and TSCR: Time Saving and Cost Reduction

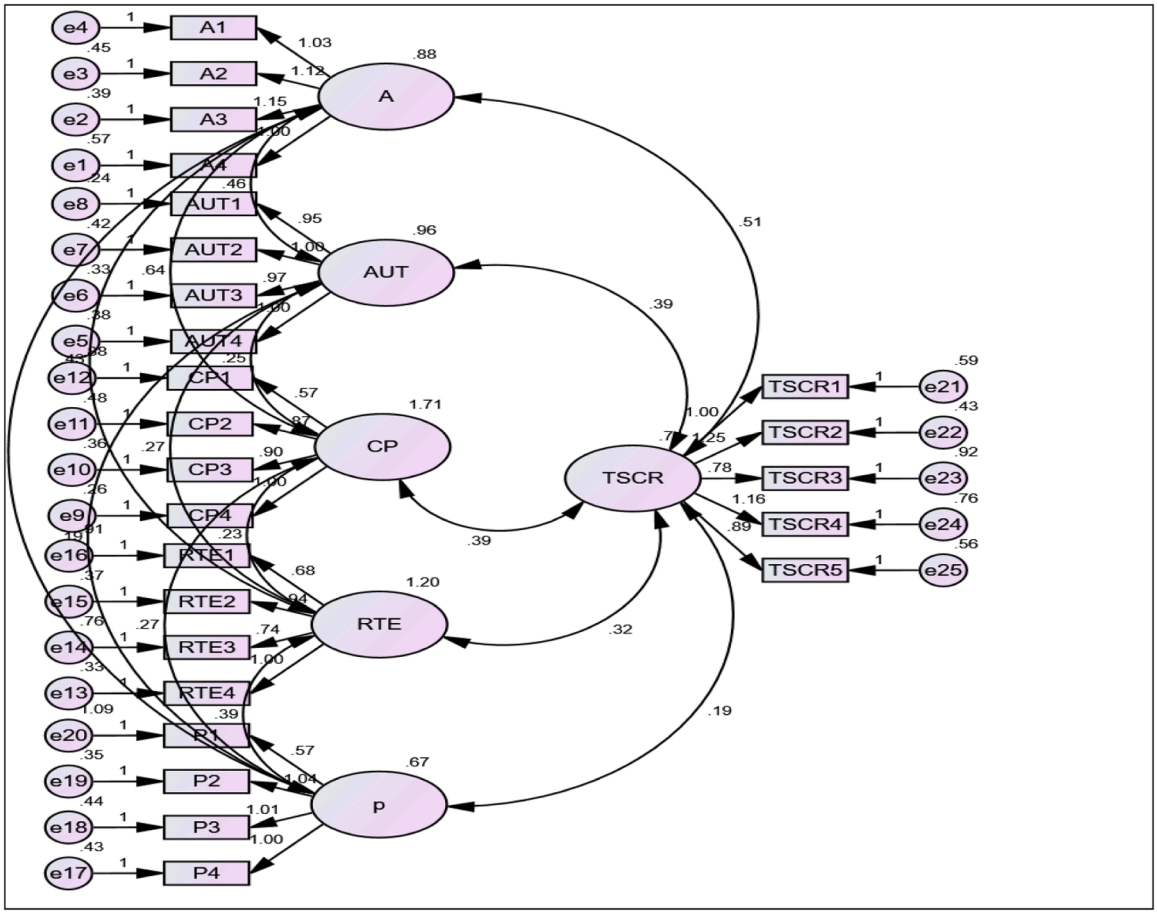


Fig. 1. Confirmatory factor analysis.
Source: Own development

attrition and help the right talents stay (Dahlbom et al., 2020). Real-time capabilities enable AI systems to process data and provide insights instantaneously, facilitating swift decision-making and timely interventions (de Laat et al., 2020). Harnessing AI's real-time potential empowers organizations to react promptly to changing circumstances, capitalize on immediate insights, and drive tangible reductions in time-related expenses and operational costs.

Lastly, the fifth hypothesis is not supported by the study results, the causal variable personalization has no significant impact on the outcome variable, Time saving & Cost Reduction in the selected IT companies. Even though several other studies are assertive that the AI- enabled personalization does lead to Time Saving & Cost Reduction, this study finding is not in line with those findings. This finding challenges the common belief that AI organizations using AI in HRM, through personalization, can procure benefits, namely Time Saving and Cost Reduction overall (Maity, 2019). The finding signifies that even though employees are positive about the outcome personalization and they believe that AI- enabled personalization tools can augment them in their work and will lead to Time-saving and cost reduction, however, the outcome, personalization, cannot directly cause time-saving & cost Reduction. Instead, this employee engagement process is time-consuming. Cost reduction can be expected after some years and not in the initial stages (Bhatnagar, 2007).

Overall, the theoretical results highlight the intricate relationships between different causal variables and their effects on the outcome variables of time-saving and cost reduction in HRM when implementing AI technologies. These findings contribute to a deeper understanding of AI's potential in HRM and provide a foundation for further research in this area.

6.2. *Managerial implications*

The managerial implications drawn from this study's findings offer practical guidance for organizations aiming to adopt AI technologies in HRM to achieve time-saving and cost reduction benefits. To maximize the benefits of AI technologies in HRM, organizations should prioritize accuracy and precision by investing in AI systems that offer reliable data analysis and decision making capabilities. The capitalize on time-saving and cost reduction opportunities, managers should strategically identify and automate repetitive tasks within HR operations. By reallocating HR professionals time from administrative tasks to more strategic initiatives, organizations can optimize their work force and allocate resources more effectively, contributing to enhanced operational efficiency and cost reduction.

However, it is crucial for organizations to be cautious about the limitations of computing power & capacity, as revealed by the study. Managers should evaluate their IT infrastructure's readiness to support AI implementations. Adequate computing resources are imperative for AI systems to function optimally and deliver desired efficiency gains. Overlooking computing power & capacity limitations may hinder the realization of time-saving and cost reduction benefits, underscoring the importance of aligning technological capabilities with strategic AI implementation. While real-time experience positively influences employee engagement organizations should recognize the potential of real-time capabilities in enhancing employee engagement and retention. Additionally, the study's finding that personalization may not directly lead to immediate cost reduction underscores the importance of managing expectations. Managers should communicate the longer-term nature of cost-saving benefits associated with AI –enabled personalization,

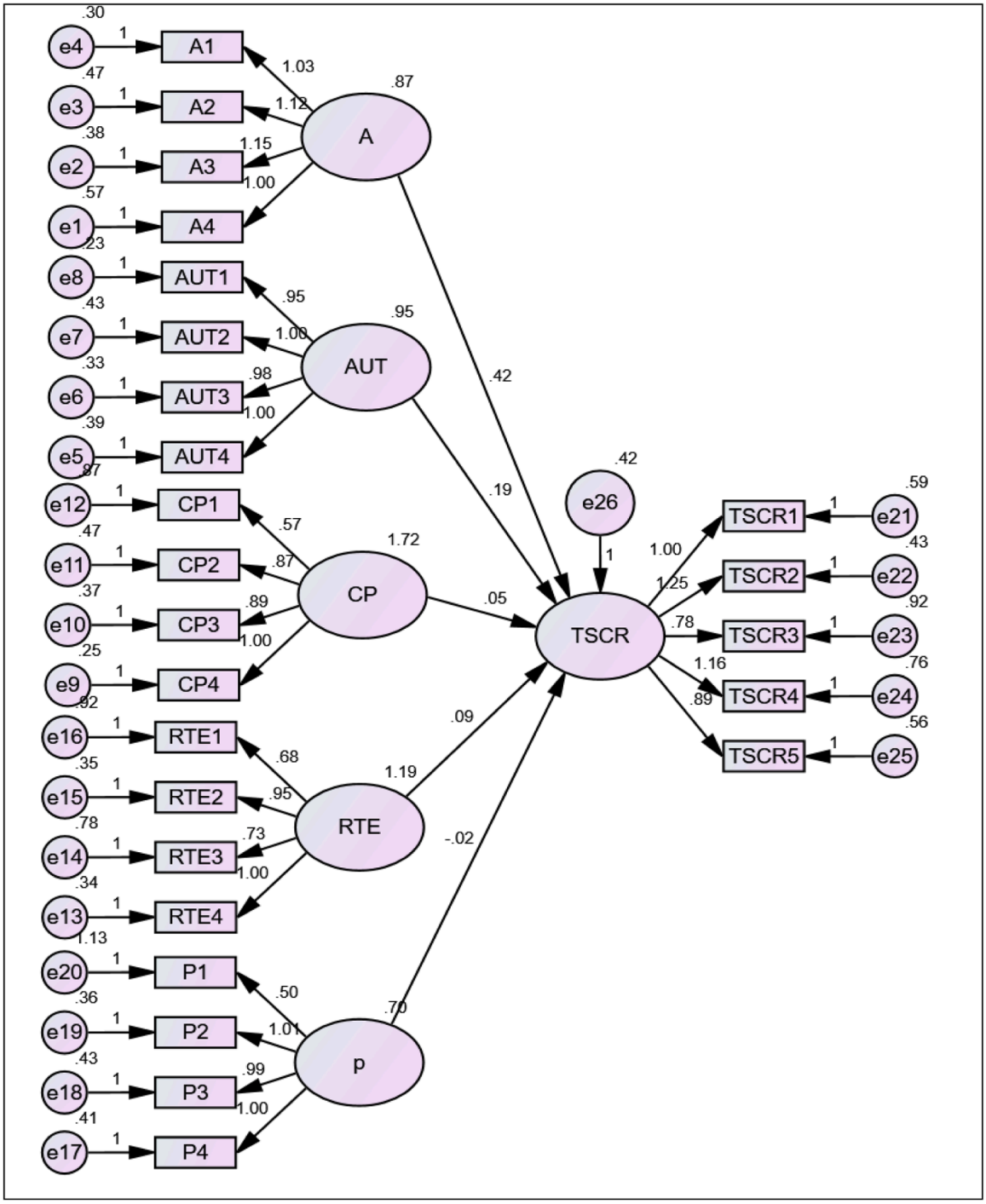


Fig. 2. Structural equation modeling.
Source: Own development

ensuring the stakeholders understand the anticipated timeline for realizing the financial advantages of such initiatives. Overall, by aligning AI strategies with these insights, organizations can effectively harness the potential of AI in HRM, achieving significant time-saving and cost reduction outcomes while optimizing their workforce management practices.

6.3. Limitations & further research directions

The study confirmed the influence of AI technologies (causal variables): Accuracy, Automation, Computing Power & Capacity, Real-time experience, and personalization only on the outcome variable of Time Saving & Cost Reduction. This research can continue by focusing on other possible results of utilizing AI in HRM practices such as unbiased, data-driven, competitive advantage, etc. The present study concentrated on Chennai-based IT organizations having 274 samples from amongst the HR professionals. This research can continue more sample sizes from other metropolitan cities like Bangalore, Hyderabad, and Delhi. Since this research is confined only to the information technology sector, the study's findings may not apply to other sectors like Healthcare, Tourism, etc. Moreover, future research can also be focused on the challenges of implementing AI in human resources management practices. An analysis

of motivational factors or determinants of using AI in other sectors and industries can be considered.

7. Conclusion

The present research aims to investigate the adoption of AI in HRM practices. The study also focused to assess the impact of causal variables, namely Accuracy, Automation, Computing Power & Capacity, Real-Time experience, and Personalization. The study established that AI technologies offer numerous opportunities and benefits to HR departments, augmenting human resource management in all possible ways (Kumari & Hemalatha, 2019). As disruptive technologies like AI become inevitable, the workforce needs to equip themselves with the required skill sets to survive the job market competition.

Drawing from existing literature, this study identified seven potential outcomes, and an attempt is made to find out the causal relationship among those variables. The study found that causal variables accuracy, automation, real-time experience do impact the outcome variable time-saving & cost reduction. Nevertheless, it is revealed that technologies like AI can be used in various ways to streamline the HRM process and improve management and work's overall efficiency. Although respondents express optimism towards all seven AI potential outcome variables, they are uncertain whether causal outcomes computing Power & Capacity and personalization features of AI will lead to cost-effectiveness and time-saving.

In conclusion, the research sheds light on the promising outcomes of using AI in HRM, it is evident from the findings that each and every outcome of using AI in HRM itself is related to each other and these causal outcomes are influencing the other outcome variables as well. Overall, the respondents have been optimistic towards all the seven AI variables but are not confident whether AI technologies regarding computing Power & Capacity and personalization may lead to cost-effectiveness and time-saving. It is recommended that in order to fully harness the potential of AI, organizations should create awareness among the employees about the AI computing power & capacity, and personalization aspects. Employees need to be educated about the man-machine collaboration, to enable the organizations join hands with AI technologies to be an extension to the HR team and an augmentation tool. A thoughtful and cautious approach to AI implementation, considering both benefits and challenges, will pave the way for successful integration of AI technologies in HRM practices.

CRediT authorship contribution statement

Nishad Nawaz: Project administration, Supervision, Writing – review & editing, Funding acquisition, Writing – original draft. **Hemalatha Arunachalam:** Data curation, Validation, Visualization, Conceptualization, Resources, Writing – original draft. **Barani Kumari Pathi:** Conceptualization, Formal analysis, Investigation, Resources, Software. **Vijayakumar Gajenderan:** .

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors would like to acknowledge that this research work was partially financed by Kingdom University, Bahrain from the research grant number 2017–59.

References

Achchab, S., & Temsamani, Y. K. (2021). Artificial intelligence use in human resources management: Strategy and operation's impact. In *2021 IEEE 2nd International Conference on Pattern Recognition and Machine Learning (PRML)* (pp. 311–315). https://doi.org/10.1109/PRML52754.2021.9520719

Agostinelli, S., Lupia, M., Marrella, A., & Mecella, M. (2020). *Automated generation of executable RPA scripts from user interface logs* (pp. 116–131). https://doi.org/10.1007/978-3-030-58779-6_8.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411.

Baggio, B., & Omana, N. (2019). AI and the agile workplace. *IMCIC 2019 - 10th International Multi-Conference on Complexity, Informatics and Cybernetics, Proceedings, 2*(2), 103–109.

Bhatnagar, J. (2007). Talent management strategy of employee engagement in Indian ITES employees: Key to retention. *Employee Relations, 29*(6), 640–663. https://doi.org/10.1108/01425450710826122

Bongarzoni, P., & Marturano, A. (2020). Switching organizations for the digital age: A new strategic approach. *CEUR Workshop Proceedings, 2789*, 43–52 (Stpis).

Braun, A., Zweck, A., & Holtmannspötter, D. (2016). The ambiguity of intelligent algorithms: Job killer or supporting assistant. *European Journal of Futures Research, 4*(1), 1–8. https://doi.org/10.1007/s40309-016-0091-3

Burgess, A., & Burgess, A. (2018). AI in Action. *The Executive Guide to Artificial Intelligence: How to Identify and Implement Applications for AI in Your Organization*, 73–89.

Chen, Z. (2022). Artificial intelligence-virtual trainer: Innovative didactics aimed at personalized training needs. *Journal of the Knowledge Economy, 29*, 2007–2025. https://doi.org/10.1007/s13132-022-00985-0

Chowdhury, S., Dey, P., Joel-Edgar, S., Bhattacharya, S., Rodriguez-Espindola, O., Abadie, A., & Truong, L. (2023). Unlocking the value of artificial intelligence in human resource management through AI capability framework. *Human Resource Management Review, 33*(1), Article 100899. https://doi.org/10.1016/J.HRMR.2022.100899

Chwastek, R. (2017). Cognitive systems in human resources. In *Proceedings of 4th International Conference on Behavioral, Economic, and Socio-Cultural Computing, BESC 2017, 2018-January* (pp. 1–4). https://doi.org/10.1109/BESC.2017.8256384

Dahlbom, P., Siikanen, N., Sajasalo, P., & Jarvenpää, M. (2020). Big data and HR analytics in the digital era. *Baltic Journal of Management, 15*(1), 120–138. https://doi.org/10.1108/BJM-11-2018-0393

de Laat, M., Joksimovic, S., & Ifenthaler, D. (2020). Artificial intelligence, real-time feedback and workplace learning analytics to support in situ complex problem-solving: A commentary. *International Journal of Information and Learning Technology, 37*(5), 267–277. https://doi.org/10.1108/IJILT-03-2020-0026

Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2019). Artificial intelligence for decision making in the era of Big Data – evolution, challenges and research agenda. *International Journal of Information Management, 48*(January), 63–71. https://doi.org/10.1016/j.ijinfomgt.2019.01.021

Ertel, W. (2011). *Introduction to artificial intelligence*. London: Springer. https://doi.org/10.1007/978-0-85729-299-5

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

G.M, S., & Suganthi, S. K. (2022). AI based suitability measurement and prediction between job description and job seeker profiles. *International Journal of Information Management Data Insights, 2*(2), 1–10. https://doi.org/10.1016/j.jjimei.2022.100109

Garg, S., Sinha, S., Kar, A. K., & Mani, M. (2022). A review of machine learning applications in human resource management. *International Journal of Productivity and Performance Management, 71*(5), 1590–1610. https://doi.org/10.1108/IJPPM-08-2020-0427

George, G., & Thomas, M. R. (2019). Integration of artificial intelligence in human resource. *International Journal of Innovative Technology and Exploring Engineering, 9*(2), 5069–5073. https://doi.org/10.35940/ijitee.L3364.129219

GERBING, D. W., & ANDERSON, J. C. (1992). Monte Carlo evaluations of goodness of fit indices for structural equation models. *Sociological Methods & Research, 21*(2), 132–160. https://doi.org/10.1177/0049124192021002002

Ghasemzadeh, H., Amini, N., Saeedi, R., & Sarrafzadeh, M. (2015). Power-aware computing in wearable sensor networks: An optimal feature selection. *IEEE Transactions on Mobile Computing, 14*(4), 800–812. https://doi.org/10.1109/TMC.2014.2331969

Gill, S. S., Tuli, S., Xu, M., Singh, I., Singh, K. V., Lindsay, D., Tuli, S., Smirnova, D., Singh, M., Jain, U., Pervaiz, H., Sehgal, B., Kaila, S. S., Misra, S., Aslanpour, M. S., Mehta, H., Stankovski, V., & Garraghan, P. (2019). Transformative effects of IoT, Blockchain and Artificial Intelligence on cloud computing: Evolution, vision, trends and open challenges. *Internet of Things, 8*, Article 100118. https://doi.org/10.1016/j.iot.2019.100118

Gopal, G., Suter-Crazzolara, C., Toldo, L., & Eberhardt, W. (2018). Digital transformation in healthcare - Architectures of present and future information technologies. *Clinical Chemistry and Laboratory Medicine (CCLM), 57*. https://doi.org/10.1515/cclm-2018-0658

Gromov, A. Y., Petrovskaia, T. A., Suslina, A. A., Khizriyeva, N. I., & Stepanov, M. A. (2018). Human resources intelligent selection algorithm with improvement of data validity. In *2018 7th Mediterranean Conference on Embedded Computing, MECO 2018 - Including ECYPS 2018, Proceedings, June* (pp. 1–4). https://doi.org/10.1109/MECO.2018.8406036

Haenlein, M., & Kaplan, A. (2019). A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence. *California Management Review, 61*(4), 5–14. https://doi.org/10.1177/0008125619864925

Hemalatha, A., Kumari, P. B., Nawaz, N., & Gajenderan, V. (2021). Impact of Artificial Intelligence on Recruitment and Selection of Information Technology Companies. In *Proceedings - International Conference on Artificial Intelligence and Smart Systems, ICAIS 2021* (pp. 60–66). https://doi.org/10.1109/ICAIS50930.2021.9396036

Hmoud, B. I., & Várallyai, L. (2020). Artificial intelligence in human resources information systems: Investigating its trust and adoption determinants. *International Journal of Engineering and Management Sciences, 5*(1), 749–765. https://doi.org/10.21791/ijems.2020.1.65

Hmoud, B., & Laszlo, V. (2019). Will artificial intelligence take over human resources recruitment and selection? *Network Intelligence Studies, 7*(13), 31–30.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.

Huang, X., Yang, F., Zheng, J., Feng, C., & Zhang, L. (2023). Personalized human resource management via HR analytics and artificial intelligence: Theory and implications. *Asia Pacific Management Review*. https://doi.org/10.1016/j.apmrv.2023.04.004

Hughes, C., Robert, L., Frady, K., & Arroyos, A. (2019a). Artificial intelligence, employee engagement, fairness, and job outcomes. *Managing Technology and Middle- and Low-Skilled Employees, July*, 61–68. https://doi.org/10.1108/978-1-78973-077-720191005

Hughes, C., Robert, L., Frady, K., & Arroyos, A. (2019b). Artificial intelligence, employee engagement, fairness, and job outcomes. *Managing Technology and Middle- and Low-Skilled Employees*, 61–68.

Iqbal, F. M. (2018). Can artificial intelligence change the way in which companies recruit, train, develop and manage human resources in workplace? *Asian Journal of Social Sciences and Management Studies, 5*(3), 102–104. https://doi.org/10.20448/journal.500.2018.53.102.104

Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons, 61*(4), 577–586. https://doi.org/10.1016/j.bushor.2018.03.007

Johnson, R. D., Stone, D. L., & Lukaszewski, K. M. (2020). The benefits of eHRM and AI for talent acquisition. *Journal of Tourism Futures, ahead-of-p*. https://doi.org/10.1108/JTF-02-2020-0013

Kalia, P., & Mishra, G. (2023). Role of artificial intelligence in re-inventing human resource management. *The adoption and effect of artificial intelligence on human resources management, part b* (pp. 221–234). Emerald Publishing Limited.

Khaled, A. S. D., Sharma, D. K., Yashwanth, T., Reddy, V. M. K., doewes, R. I., & Naved, M. (2023). Evaluating the role of robotics. In S. Yadav, A. Haleem, P. K. Arora, & H. Kumar (Eds.), *Machine Learning and Artificial Intelligence in the Field of Performance Management BT - Proceedings of Second International Conference in Mechanical and Energy Technology* (pp. 285–293). Singapore: Springer Nature.

Khatri, S., Pandey, D.K., Penkar, D., & Ramani, J. (2020). *Impact of artificial intelligence on human resources bt - Data Management, analytics and innovation* (N. Sharma, A. Chakrabarti, & V. E. Balas (eds.); pp. 365–376). Springer Singapore.

Kumari, P. B., & Hemalatha, A. (2019). Perception towards artificial intelligence in human resources management practices –with reference to IT companies in Chennai. *International Journal of Recent Technology and Engineering, 8*(4S3), 61–65. https://doi.org/10.35940/ijrte.d1045.1284s319

Langer, M., König, C. J., & Papathanasiou, M. (2019). Highly automated job interviews: Acceptance under the influence of stakes. *International Journal of Selection and Assessment, 27*(3), 217–234. https://doi.org/10.1111/ijsa.12246

Ma, Y., Wang, Z., Yang, H., & Yang, L. (2020). Artificial intelligence applications in the development of autonomous vehicles: A survey. *IEEE/CAA Journal of Automatica Sinica, 7*(2), 315–329.

MacCallum, R. C., & Browne, M. W. (1993). The use of causal indicators in covariance structure models: Some practical issues. In *, Vol. 114, Issue 3. Psychological Bulletin* (pp. 533–541). American Psychological Association. https://doi.org/10.1037/0033-2909.114.3.533.

Maity, S. (2019). Identifying opportunities for artificial intelligence in the evolution of training and development practices. *Journal of Management Development, 38*(8), 651–663. https://doi.org/10.1108/JMD-03-2019-0069

Malik, A., Budhwar, P., Patel, C., & Srikanth, N. R. (2022a). May the bots be with you! Delivering HR cost-effectiveness and individualised employee experiences in an MNE. *The International Journal of Human Resource Management, 33*(6), 1148–1178. https://doi.org/10.1080/09585192.2020.1859582

Malik, A., Thevisuthan, P., & De Sliva, T. (2022b). Artificial intelligence, employee engagement, experience, and HRM BT. In A. Malik (Ed.), *Strategic human resource management and employment relations: An international perspective* (pp. 171–184). Springer International Publishing. https://doi.org/10.1007/978-3-030-90955-0_16.

Malik, N., Tripathi, S., Kar, A., & Gupta, S. (2021). Impact of artificial intelligence on employees working in industry 4.0 led organizations. *International Journal of Manpower*. https://doi.org/10.1108/IJM-03-2021-0173

Mathipriya, B., Minhaj, I., Rodrigo, L. D. C. P., Abiylackshmana, P., & Kahandawaarachchi, K. A. D. C. P. (2019). Employee readiness towards artificial intelligence in Sri Lankan banking context. In *2019 International Conference on Smart Applications, Communications and Networking, SmartNets 2019*. https://doi.org/10.1109/SmartNets48225.2019.9069797

McCarthy, J., Minsky, M., Selfridge, O., Solomonoff, R., More, T., Shannon, C., Rochester, N., Samuel, A., Newell, A., & Simon Lipson, H. (2019). Artificial Intelligence and HR : The new wave of technology. *Journal of Advances in Social Science and Humanities, 5*(4), 715–720. https://doi.org/10.15520/jassh5

Meshram, R. (2023). The role of artificial intelligence (ai) in recruitment and selection of employees in the organisation. *Russian Law Journal, 11*(9s), 322–333. https://doi.org/10.52783/rlj.v11i9s.1624

Minbaeva, D. (2021). Disrupted HR? *Human Resource Management Review, 31*(4). https://doi.org/10.1016/j.hrmr.2020.100820

Mintz, Y., & Brodie, R. (2019). Introduction to artificial intelligence in medicine. *Minimally Invasive Therapy & Allied Technologies, 28*(2), 73–81. https://doi.org/10.1080/13645706.2019.1575882

Modgil, S., Singh, R. K., & Hannibal, C. (2022). Artificial intelligence for supply chain resilience: Learning from COVID-19. *The International Journal of Logistics Management, 33*(4), 1246–1268. https://doi.org/10.1108/IJLM-02-2021-0094

Morgenstern, J. D., Rosella, L. C., Daley, M. J., Goel, V., Schünemann, H. J., & Piggott, T. (2021). AI's gonna have an impact on everything in society, so it has to have an impact on public health": A fundamental qualitative descriptive study of the implications of artificial intelligence for public health. *BMC public health, 21*(1), 1–14. https://doi.org/10.1186/s12889-020-10030-x

Murshed, M. G. S., Murphy, C., Hou, D., Khan, N., Ananthanarayanan, G., & Hussain, F. (2021). Machine learning at the network edge: A survey. *ACM Comput. Surv., 54*(8). https://doi.org/10.1145/3469029

Nawaz, N. (2019). Artificial intelligence is transforming recruitment effectiveness in CMMI level companies. *International Journal of Advanced Trends in Computer Science and Engineering, 8*(6), 3017–3021. https://doi.org/10.30534/ijatcse/2019/56862019

Nawaz, N., & Gomes, A. M. (2019). Artificial intelligence chatbots are new recruiters. *International Journal of Advanced Computer Science and Applications, 10*(9), 1–5. https://doi.org/10.14569/ijacsa.2019.0100901

Niehueser, W., & Boak, G. (2020). Introducing artificial intelligence into a human resources function. *Industrial and Commercial Training, 52*(2), 121–130. https://doi.org/10.1108/ICT-10-2019-0097

Nocker, M., & Sena, V. (2019). Big data and human resources management: The rise of talent analytics. *Social Sciences, 8*(10), 1–19. https://doi.org/10.3390/socsci8100273

Parry, E., & Battista, V. (2019). The impact of emerging technologies on work: A review of the evidence and implications for the human resource function [version 1; peer review: 2 approved, 1 approved with reservations] *Emerald Open Research, 1*(5), 1–13.

Pillai, R., & Sivathanu, B. (2020). Adoption of artificial intelligence (AI) for talent acquisition in IT/ITeS organizations. *Benchmarking, 27*(9), 2599–2629. https://doi.org/10.1108/BIJ-04-2020-0186

Renganathan, R., Balachandran, S., & Govindarajan, K. (2012). Customer perception towards banking sector: Structural equation modeling approach. *African Journal of Business Management, 6*(46), 11426–11436. https://doi.org/10.5897/ajbm12.445

Rai, A., & Singh, L. B. (2023). Artificial intelligence-based people analytics transforming human resource management practices. In P. Tyagi, N. Chilamkurti, S. Grima, K. Sood, & B. Balusamy (Eds.), *The adoption and effect of artificial intelligence on human resources management, part a* (pp. 229–244). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80382-027-920231012.

Ravin, J. (2017). HR's new role: Rethinking and enabling digital engagement. *Strategic HR Review, 16*(2).

Rodgers, W., Murray, J. M., Stefanidis, A., Degbey, W. Y., & Tarba, S. Y. (2023). An artificial intelligence algorithmic approach to ethical decision-making in human resource management processes. *Human Resource Management Review, 33*(1), 1–19. https://doi.org/10.1016/j.hrmr.2022.100925

Sahota, N., & Ashley, M. (2019). When robots replace human managers: introducing the quantifiable workplace. *IEEE Engineering Management Review, 47*(3), 21–23. https://doi.org/10.1109/EMR.2019.2931654

Savola, H., Troqe, B., & Gebauer, H. (n.d.). *Recruiters just wanna have...AI? implications of implementing AI in HR recruitment*.

Sivathanu, B., & Pillai, R. (2018). Smart HR 4.0 – how industry 4.0 is disrupting HR. *Human Resource Management International Digest, 26*(4), 7–11. https://doi.org/10.1108/HRMID-04-2018-0059

Sołek-Borowska, C., & Wilczewska, M. (2018). New technologies in the recruitment process. *Economics and Culture, 15*(2), 25–33. https://doi.org/10.2478/jec-2018-0017

Sugawara, E., & Nikaido, H. (2014). Properties of AdeABC and AdeIJK efflux systems of *Acinetobacter baumannii* compared with those of the AcrAB-TolC system of *Escherichia coli*. *Antimicrobial Agents and Chemotherapy, 58*(12), 7250–7257. https://doi.org/10.1128/AAC.03728-14

Thomas, S., Kureshi, S., Suggala, S., & Mendonca, V. (2020). HRM 4.0 and the shifting landscape of employer branding. *Human and technological resource management (HTRM): New insights into revolution 4.0* (pp. 37–51). https://doi.org/10.1108/978-1-83867-223-220201003

Tobbin, P., & Kuwornu, J. K. M. (2011). Adoption of mobile money transfer technology: Structural equation modeling approach. *European Journal of Business and Management, 3*(7), 59–78.

Varsha, P. S., Dr. (2023). How can we manage biases in artificial intelligence systems – A systematic literature review. *International Journal of Information Management Data Insights, 3*(1), Article 100165. https://doi.org/10.1016/j.jjimei.2023.100165

Vedapradha, R., Hariharan, R., & Shivakami, R. (2019). Artificial intelligence: A technological prototype in recruitment. *Journal of Service Science and Management, 12*(03), 382–390. https://doi.org/10.4236/jssm.2019.123026

Votto, A. M., Valecha, R., Najafirad, P., & Rao, H. R. (2021). Artificial intelligence in tactical human resource management: A systematic literature review. *International Journal of Information Management Data Insights, 1*(2), 1–15. https://doi.org/10.1016/j.jjimei.2021.100047

Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2021). Artificial intelligence, robotics, advanced technologies and human resource management: A systematic review. *The International Journal of Human Resource Management*, 1–30. https://doi.org/10.1080/09585192.2020.1871398

Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2022). Artificial intelligence, robotics, advanced technologies and human resource management: A systematic review. *The International Journal of Human Resource Management, 33*(6), 1237–1266. https://doi.org/10.1080/09585192.2020.1871398

Waheed, A., Miao, X., Waheed, S., Ahmad, N., & Majeed, A. (2019). How new HRM practices, organizational innovation, and innovative climate affect the innovation performance in the IT industry: A moderated-mediation analysis. *Sustainability, 11*(3), 621. https://doi.org/10.3390/su11030621

Wang, X.-L., Lei, N., & Hou, Y.-Z. (2020). How does human resource department's client relationship management affect sustainable enterprise performance-in the context of artificial intelligence? *International Journal of Technology Management, 84*(1–2), 50–69.

Wiradendi Wolor, C. (2020). Implementation talent management to improve organization's performance in Indonesia to fight industrial revolution 4.0. *International Journal of Scientific & Technology Research*.

Xu, Y., Shieh, C. H., van Esch, P., & Ling, I. L. (2020). AI customer service: Task complexity, problem-solving ability, and usage intention. *Australasian Marketing Journal, 28*(4), 189–199. https://doi.org/10.1016/j.ausmj.2020.03.005