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Enhancing Employee Engagement and Retention through AI-Powered Human Resource Software Solutions

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Abstract:

This paper examines how employee engagement and retention can be enhanced through AI-powered human resource software solutions. The objectives of the study are:

- *To determine the possible impact of Artificial Intelligence on Employee engagement and retention,*
- *To assess the extent to which AI brings sustainability to human resource functions within the organization and*
- *To assess the current trends of Artificial Intelligence in human resource management.*

The study adopts a descriptive research design approach with a cross-sectional methodology; this approach helps the collection of data from a large population at a particular time, enabling a complete assessment of the subject matter. The study's population comprises human resource professionals employed across different sectors, including manufacturing, information technology, and services, within the city of New York, USA. A total of four hundred (400) questionnaires were distributed using Google Forms, and after careful examination, 285 questionnaires met the requirement for analysis, which resulted in a response rate of 70%. The collected data went through primary statistical analysis using the Statistical Package for Social Sciences (SPSS), and the recommended model was later examined using Analysis of Moment Structures (AMOS). The measurement scales utilized in this study were exposed to comprehensive assessments of both validity and reliability, which yielded favorable results that validated the continuation of the exploration. The analysis shown in this research offers intense insights into the complex relationships between various aspects of human resource management and the impact of artificial intelligence software solutions on human resources. The findings show that AI plays a crucial role in revolutionizing human resource practices and fostering employee engagement and retention.

Keywords: *Human resource management, IT, job satisfaction, machine learning, performance management,*

1. Introduction

Employee engagement and retention are critical factors in an organization's performance, impacting workplace satisfaction and overall productivity. As the business landscape continues to evolve, so do the technologies and tools used to enhance employee engagement and retention. Employee engagement means the level of motivation, commitment, and involvement that employees have towards their job (Seal, 2019). Employee engagement is pivotal in the achievement of corporate goals and serves as an important element for enhancing productivity, promoting job satisfaction, and, eventually, improving overall organizational performance. Employee engagement is a concept characterized by the emotional investment and loyalty that people exhibit towards their job duties and the overall entity they are stricken to. Retention has been seen to be influenced by employee engagement; retention is the ability of the workers to continue working on the same job or in the same workplace; employee retention is influenced by workers' satisfaction (Aazam et al., 2019).

Artificial Intelligence (AI) has become a game-changer across different industries, completely transforming traditional processes and restructuring the operational scenery for organizations. The field OF Human Resource Management (HRM) is no exception, as AI's incorporation into the sector has begun to restructure key functions: recruitment, performance management, and employee experiences (Qamar et al., 2021). The role of Human Resources has factually been centred on the management of people, encompassing recruitment, training, performance appraisal, and employee welfare. However, with the rapid improvements in AI technologies, human resource practices are going through a profound metamorphosis. Artificial Intelligence, including natural language processing, deep learning, machine learning, and data analytics, has shown unprecedented abilities to analyze a vast amount of data, identify patterns, and derive significant insights. These abilities have paved the way for human resource people to enhance the overall employee journey, make more conversant decisions, and streamline processes (Changrok & Daniel, 2020).

Artificial Intelligence (AI) is a discipline that focuses on the fabrication of smart machines capable of carrying out tasks. Artificial intelligence (AI) deals with a range of technological improvements that help computers to carry out diverse, sophisticated activities, such as comprehension and interpretation of written and spoken language, provision of suggestions, data analysis, and visual perception, among others (Chakraborty et al., 2019). Artificial intelligence (AI)

serves as an essential ingredient driving innovation in modern computing, enabling the creation of important benefits for both people and enterprises. One example of utilizing artificial intelligence is the use of optical character recognition (OCR), which makes the extraction of textual information and data from various documents and photos possible. This technology helps in changing unorganized content into structured data that is appropriate for business purposes, eventually providing access to valuable insights (Xu et al., 2018).

The field of AI pertains to the scientific endeavor of making machines and computers capable of learning, reasoning and engaging in decision-making processes that naturally require human intelligence. Moreover, it encompasses the analysis of data sets that are beyond the analytical power of the people. Artificial Intelligence is a multidisciplinary area that spans diverse fields such as data analytics, hardware and software engineering, statistics, computer science, neurology, languages, as well as psychology and philosophy (Dorleta et al., 2018).

At an operational level within the context of business applications, AI encompasses a collection of tools mostly rooted in deep learning and machine learning. These tools are used for various purposes, such as predictive modelling, forecasting, natural language processing, data analytics, object classification, intelligent data retrieval, recommendation systems, and other related tasks (Goyal, 2021). The utilization of AI necessitates a vital infrastructure that comprises dedicated hardware and software components to help develop and implement machine learning algorithms. There is no one programming language that can be considered similar to artificial intelligence (AI). However, R, Python, C++, Java, and Julia are computer programming languages that possess capabilities that are widely preferred among developing people working in the field of artificial intelligence (Sarkar et al., 2021).

While the incorporation of Artificial Intelligence in human resources offers several advantages, it also presents issues that warrant careful consideration. Data privacy and security considerations arise as organizations gather and analyze vast amounts of employee data. Furthermore, the opacity of some Artificial Intelligence algorithms poses issues about accountability and transparency, especially when AI is utilized in decision-making processes that have an impact on employees' careers. The potential for bias in the algorithm also raises ethical considerations, as biased algorithms can maintain existing inequalities (Yawalkar, 2019).

In the light of these issues, it is vital for organizations to approach Artificial Intelligence incorporation in HR with a detailed and responsible strategy. Ethical concerns must be vital, with a focus on fairness, accountability and transparency in the use of AI technologies. Legal frameworks need to adjust to make sure there is protection of employee data and privacy in this age of Artificial Intelligence.

This study seeks to find answers to the following research questions:

- What is the possible impact of Artificial Intelligence on Employee engagement and retention?
- To what extent does AI bring sustainability to human resource functions within the organization?
- What are the current trends in human resource management using artificial intelligence (AI)?

2. Literature Review

The human resource functions have transformed over the years and are considered to the non-static (Bibi, Butt & Naqvi, 2016). It marks the beginning of a new era characterized by the union of the physical and digital realms (Birgit et al., 2017), the strengthening of the relationship between humans and machines (Dorleta et al., 2018; Urba et al., 2015), and the enhancement of automation through the incorporation of intelligent software with smart technologies. Artificial intelligence is being used across different facets of human resource management, including recruitment, performance measurement, and data management within cloud-based human resource systems (Sarkar et al., 2021). While these researchers argue that Artificial Intelligence appears to be gaining control over many human resource functions, a notable limitation is that neither (Garima, Vikram & Vinay) nor (George & Thomas) addressed the issues that human resource departments go through while implementing Artificial Intelligence machinery across their various functions (Urba, et al., 2015; Sakar, et al., 2021). According to Jia, Guo, Li and Chen (2021), the majority of businesses are not prepared for the full-scale incorporation of Artificial Intelligence into human resource operations. However, Vivek and Yawalka noted the issues in finding the right candidates to take care of AI tools and the growing concern that AI is preventing the self-sufficiency of human resource departments as technology is becoming more dominant (Dorleta et al., 2018; Priyanka et al., 2023). However, a detailed exploration of the potential challenges in implementing this technology within the organization's HRM has yet to be conducted.

2.1. Role of Artificial Intelligence in Human Resource Practices

In recent times, there has been a noticeable increment in the use of artificial intelligence in various sectors, including human resource management. Technological advancements have led to a growing demand for digitization, automation and agility in human resource practices. Artificial Intelligence has the capacity to transform human resource practices, as it can improve accuracy, decision-making, and efficiency in human resource functions. One of the key areas where artificial intelligence can make a noticeable impact on human resources is recruitment and talent acquisition (Tong et al., 2021). AI-powered algorithms can scan job applications to identify suitable candidates who meet the requirements; this reduces the time and effort needed for manual screening. AI can also analyze candidates' information to forecast which candidates are most likely to succeed in a role, thereby enhancing the quality of the recruitment process.

Another area where artificial intelligence can play a vital role is in employee engagement and retention. By analyzing employee information, AI algorithms can study patterns and trends that may show low engagement or high turnover rates. This data can help human resource professionals take necessary measures to address these concerns, such as improving workplace culture or implementing training programs (Kalischko & Riedl, 2021). Artificial intelligence can

also be utilized in the enhancement of learning and development programs for employees; by analyzing employee data, AI algorithms can locate knowledge gaps and recommend training programs to correct these (Chowdhury et al., 2018). AI-powered learning platforms can make learning personal to suit each individual's employee needs, thereby enhancing learning outcomes (Buck & Morrow, 2018).

Artificial Intelligence can also have an important impact on performance management (Euchner, 2019). AI algorithms can scrutinize employee performance data to note key areas where improvements can be made. This data can be utilized in the development of personalized performance improvement plans for individual employees that can enhance overall productivity and performance (Kellogg et al., 2020). It plays a crucial role in making sure that the workplace is safe. By analyzing information from sensors and other devices, artificial intelligence algorithms can locate potential safety threats and recommend preventive measures to handle risks. This can aid in reducing workplace injuries and accidents and ensure compliance with safety regulations (Priyanka et al., 2023; Buck & Morrow, 2018).

2.2. Application of Artificial Intelligence in Human Resource

The impact of artificial intelligence on human resources is rapidly growing, and it is poised to reshape human resource activities through comprehensive and relevant analyses across different functions. Functions such as employee engagement, performance management, recruitment and selection, and retention now gain from the support of virtual assistants. The formation of a Human Resource Information System lays the foundation for Artificial Intelligence applications. HRIS is defined as a system for gathering, storing, managing, retrieving, and authenticating information necessary for an organization's personnel activities, human resources, and organizational unit characteristics (Yawalkar, 2019).

Artificial intelligence holds the promise of revolutionizing human resource practices through improved effectiveness, precision, and decision-making in human resource functions. One key area where artificial intelligence can exercise a considerable impact on human resources is talent acquisition and recruitment (Kovach & Cathcart, 2019). AI-powered algorithms can quickly evaluate resumes and job applications, identifying qualified candidates according to predefined criteria, thereby reducing the time and manual labor needed for initial screening. Furthermore, AI can analyze candidate information to forecast which persons are more likely to shine in specific roles, thus improving the overall quality of the recruitment process.

2.3. Impact of Artificial Intelligence on the Components of Human Resource Management

The incorporation of Artificial Intelligence (AI) has sparked revolutionary shifts in employee experience in today's dynamic workplace landscape. By using AI, organizations are changing recruitment processes, elevating performance management, and enabling a more engaging work environment. By installing AI-driven tools, companies improve their ability to source outstanding talent, deliver targeted development opportunities, and ensure the workplace is supportive and efficient so it can adapt to the dynamic needs of its employees.

2.3.1. Recruitment and AI

Recruitment is an essential facet of human resource practices, entailing the attraction, strategic identification, and selection of individuals who fit the organizational roles. This dynamic process includes stages such as job sources, analysis, screening, interviewing, selection and seamless onboarding, all channelled to align candidate skills with job needs and overarching company goals (Nazri et al., 2019). By blending traditional and modern approaches, recruiters aim to recognize candidates who not only meet the needed qualifications but also line up with the organization's culture, thus playing a role in its success and development.

The present demand for talent is reaching extraordinary levels, placing recruiting teams under pressure to fulfil motivated hiring targets. Recruiters are dedicating extensive efforts to the task of selecting and onboarding top talent, yet they still face challenges in retaining these invaluable individuals. Organizations that have accomplished the greatest success in selecting, engaging and converting potential applicants are using personalized automation to construct a fine-tuned recruitment strategy. Recruiters who can combine technology with human touch will perform better in swiftly progressing applicants through the recruitment process and, in turn, achieving their business objectives (Bureau, 2022). AI recruiting demonstrates a hiring process that harnesses artificial intelligence to enhance various facets of the recruitment process. Within this context, artificial intelligence recruiting technologies serve as valuable assets, helping employers automate repetitive tasks and significantly reduce the workload for recruiters. These artificial intelligence algorithms are proficient at pinpointing the most qualified candidates for specific job roles by accurately analyzing a diverse range of data, including resumes, job applications, and social media profiles (Sara, 2023).

The popularity of AI technologies in the labour market is increasing, with automated decision-making technologies becoming commonplace across multiple stages of the hiring pipeline (Bendick et al., 2017; Black et al., 2020). In the sourcing phase, employers draw potential applicants through job postings and advertisements. Subsequently, during the screening stage, employers test applicants to choose a subset for individual interviews. Eventually, in the selection phase, employers make vital decisions regarding whether to reject or hire each candidate. All these stages stand to gain from the application of automated algorithms, but they also hold the risk of algorithmic bias if not considerably designed.

It is worth noting that the labor market has a past track record of unjust handling of minority groups (Bertrand & Mullainathan, 2014; Bendick, et al., 2017), emphasizing the utmost relevance of bias prevention in the design of automatic

hiring technologies. While the study of fairness in algorithmic hiring has been relatively constrained (Schumann, et al., 2020), some new research endeavors are starting to address this critical topic (Raghavan, et al., 2020).

2.3.2. Performance Management and AI

Performance management is a continuous process that involves measuring, evaluating, and enhancing the performance of both employees and teams while aligning their performance with the organization's objectives. Artificial Intelligence (AI) can play a crucial role in automating numerous facets of performance management, including report generation, data collection, and feedback delivery.

This ability can free human resource professionals, helping them to concentrate on higher-level strategic duties like formulating performance improvement strategies. AI software possesses the ability to track employee conduct in the workplace, check performance, and return personalized feedback to individuals (Tong et al., 2021). With the incorporation of artificial intelligence, algorithms can be hired to discern patterns and group and structure information, ultimately helping guide or automate decision-making regarding recruitment, termination or advancement (Kalischko & Riedl, 2021). In the area of performance management, artificial intelligence finds utility through data analytics, which deals with monitoring employee work behavior, examining performance, and proffering recommendations gotten from this data (20). Furthermore, researchers propose that AI has the prospect of influencing decision-making in human resource processes. It is debated that artificial intelligence systems can examine issues, pinpoint the root causes, and offer solutions (Chowdhury et al., 2018).

Adopting such a performance management system can offer numerous benefits. It helps automate various administrative activities, allowing managers to re-channel their attention towards more strategic responsibilities (Buck & Morrow, 2018). Additionally, artificial intelligence can amass a greater amount of information and efficiently coordinate this newfound information (Euchner, 2019). This improves the objectivity of data collection through evaluation and real-time analysis. Nonetheless, it is pertinent to acknowledge that AI relies on training data as its bedrock. Hence, the assertion of enhanced data collection quality is not an absolute certainty, as it is reliant on the quality of the algorithm used. AI possesses the ability to identify underperformance and propose relevant courses of action or support for workers in taking their careers to the next level (Kellog et al., 2020). During the data-gathering procedure, workers can be continuously observed, facilitating regulation assessment and opportunities for self-evaluation (Buck & Morrow, 2018). Artificial intelligence has the ability to predict future performance by analyzing past work behavior. It can also separately generate recommendations for terminating or hiring employees and for noting and rewarding outstanding performance.

2.3.3. Employee Satisfaction and AI

A note-worthy catalyst for an organization's success lies in using a valuable competitive edge inherent in its human resources. Organizations can utilize the potential of these human resources by synergizing them with their operational abilities (Bag et al., 2021). The digital work environment has emerged as a new paradigm, empowering employees to function with ease in both physical and virtual environments. This format improves employee performance by granting greater flexibility, eliminating unnecessary commuting, and enabling seamless work management and collaboration, free from the limitations of time and location (Koslowsky et al., 2016). Scholars have suggested that artificial intelligence has the prospect of augmenting employees' intelligence, facilitating their enhanced comprehension and resolution of complex situations. AI helps by proffering a range of alternative solutions, thereby aiding the decision-making process (Bader & Kaiser, 2019). This assistance in decision-making helps employees cultivate their creative capabilities as machines deal with routine tasks; consequently, multinational corporations equipped with a skilled workforce anticipate that artificial intelligence will offer numerous benefits to their operations (Hsieh & Hsieh, 2023). Artificial intelligence is seen as a technologically advanced intervention with a comparatively superior standing. Recent studies suggest that artificial intelligence enhances not only creative thinking but also context awareness, communication skills, self-organization capabilities and reasoning prowess.

The convergence of artificial intelligence, robotics and big data has indicated the onset of the fourth industrial revolution (Grover et al., 2020). The fundamental principle of these technological interventions is not to replace human resources but to complement human intelligence and knowledge (Jarrahi, 2018). A synergetic relationship can flourish between AI deployment and employees, offering mutual benefits. AI helps organizations to identify negative feedback, promptly act upon data-driven suggestions, analyze employee feedback sentiment, and gauge pulse survey metrics. This transforms employee engagement, performance, and retention, thereby fostering a thriving and dynamic workplace.

2.4. Conceptual Framework

The conceptual framework aims to study the interplay between three independent variables within human resource management; these variables include: Recruitment (comprising virtual assisting, predictive analysis, automated sourcing, and market insights).

AI-powered virtual assistance can take care of routine recruitment tasks, like answering candidate queries and scheduling interviews, which allows HR specialists to focus on strategic decision-making and AI incorporation in other human resource processes.

By utilizing AI for predictive analysis, companies can make more informed decisions about recruiting, leading to better talent acquisition, retention, and overall human resource practices, which rely on data insights (Tarken, 2019). Automated sourcing tools utilizing AI algorithms can speed up applicant screening, reduce human error, and identify the most suitable candidate more effectively, thus enhancing AI adoption in human resource management by making

recruitment more effective and data-driven. AI-driven market analysis can aid human resource departments in adapting their recruitment methods based on market insights, ensuring that AI adoption is in line with the evolving needs of the organization (Urba et al., 2022).

Underperformance management applications, AI can gather and analyze a large volume of performance data, providing human resources with actionable insights to enhance employee performance and align HR practices with organizational objectives, thereby increasing the adoption of AI as a means of data utilization. AI can predict employee performance trends, enabling very quick interventions and talent development strategies, thereby fostering a culture of continuous improvement and AI incorporation within human resource management (Sakar et al., 2021). AI tools can check employee engagement in real-time, allowing HR to locate areas for improvement and develop techniques that improve employee retention and job satisfaction, and, consequently, the adoption of artificial intelligence to support these endeavors. AI-driven team dynamics analysis can augment team compositions and collaborations, which leads to better performance, which in turn emphasizes the need for AI incorporation in human resource processes for data-driven decision-making (Panicker et al., 2022).

Finally, employee satisfaction applies to human resource management in terms of personalized learning; AI can shape training and development programs to individual employee requirements, increasing job satisfaction and motivation while also underlining the role of artificial intelligence in personalization within human resource management (Sivathanu et al., 2018). AI can observe and address employee well-being issues through data analysis, showing its potential to encourage a healthy work environment and promoting AI adoption as a technology for employee well-being management. AI-guided career development plans can improve employee career satisfaction and growth, showcasing the benefit of AI in human resource management. By predicting factors influencing employee satisfaction, AI can help human resources in proactive interventions to deal with concerns, stressing the role of AI in HRM for decision-making and predictive analysis (Bibi et al., 2016).

Each independent variable and its sub-variables affect the adoption of AI in human resource management by improving efficiency, overall human resource effectiveness, and data-driven decision-making. The enhancements contribute to a compelling case for incorporating AI into HRM to meet the evolving needs of businesses and their workers. All the hypotheses in this conceptual framework are framed based on the variables in an effective and systemic manner. Each hypothesis shows a logical and theoretically grounded interaction between the independent variables (recruitment, performance management, employee satisfaction, and their respective sub-variables) and the dependent variable (AI-powered human resource software solutions), ensuring a detailed and structure approach to appreciating the impact of HRM aspects on artificial intelligence adoption within organizations.

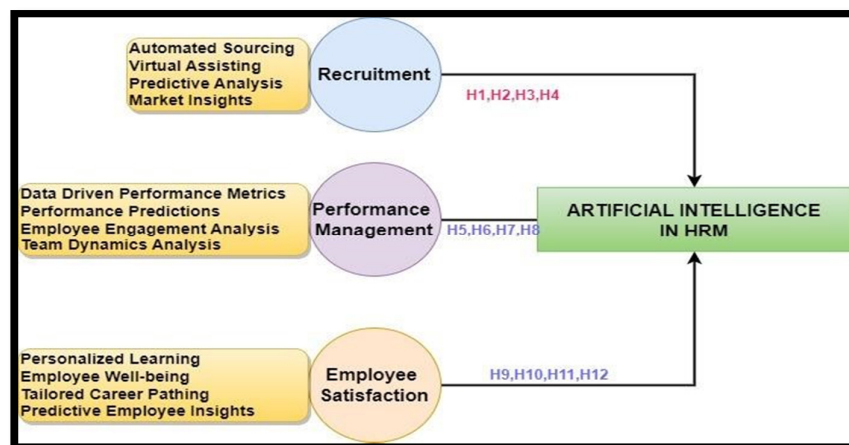


Figure 1: Conceptual Framework

3. Methodology

The study adopts a descriptive research design approach with a cross-sectional methodology; this design was preferred due to its usefulness for examining the impact of AI-powered human resource software solutions on employee engagement and retention. This approach helps the collection of data from a large population at a particular time, enabling a complete assessment of the subject matter.

3.1. Population and Sampling

The study's population comprises human resource professionals employed across different sectors, including manufacturing, information technology, and services, within the city of New York, USA. The choice of this city was due to its varied range of companies, encompassing different sectors. The service sector particularly includes private sector banks as part of the analysis. The sampling technique used was multi-stage sampling, involving the original selection of geographic locations in the first stage, followed by the ordering of companies within each sector in the second stage. Subsequently, participants were chosen from the selected firms in the third stage. A total of four hundred (400) questionnaires were distributed using Google Forms, and after careful examination, 285 questionnaires met the requirement for analysis, which resulted in a response rate of 70%.

3.2. Scale Development and Validation

The study presently assesses the constructs involved in this research model by developing new measurement scales. These scales have been made through the adaptation and fine-tuning of relevant literature. These scales went through rigorous scrutiny to ascertain their efficiency in measuring the intended constructs (Tabachnick & Fidell, 2023). According to Hinkin (2015), validity is the extent to which a scale correctly measures its intended concepts, while reliability refers to the stability of measurements over a period of time. In our exploration, we tested the validity and reliability of these scales through confirmatory factor analysis (CFA). The outcome of the confirmatory factor analysis showed that the scales demonstrated strong construct validity and reliability. Particularly, each of the constructs revealed composite reliability (CR) values that were above the recommended threshold of 0.5, which indicated strong convergent validity. Therefore, the scales used in this study were considered highly suitable for examining the specified constructs.

3.3. Data Collection

Data for the study were collected through a structured questionnaire divided into three sections. The first section contained demographic data, while the subsequent section was focused on AI applications in human resource practices. The final segment involved statements directed at examining human resource agility. Both the second and third sections utilized a 5-point Likert Scale for respondents' evaluations.

3.4. Data Analysis

The collected data went through primary statistical analysis using the Statistical Package for Social Sciences (SPSS), and the recommended model was later examined using Analysis of Moment Structures (AMOS). The measurement scales utilized in this study were exposed to comprehensive assessments of both validity and reliability, which yielded favorable results that validated the continuation of the exploration.

The research took action to make sure that the data met the assumption of multivariate normality. This was achieved by assessing the skewness and kurtosis values for each variable, all of which were proven to be within the satisfactory range of -2 to +2. More so, the study used the maximum likelihood estimation technique, which functions under the assumption of multivariate normality. To deal with missing data, the researcher used the list-wise deletion technique, efficiently removing cases with missing values from the analysis. Therefore, the final sample size comprised 285 observations, which surpassed the recommended minimum for carrying out Structural Equation Modeling (SEM) analysis (Anderson & Gerbing, 2018). The effectiveness of the model specification was protected through the use of a priori model, which was established based on the existing theoretical foundations and literature. Furthermore, the scholars conducted a confirmatory factor analysis (CFA) to examine how well the model fitted the data, assessing its goodness of fit. From table 1, the Kaiser-Meyer-Olkin (KMO) technique of sampling adequacy shows a strong suitability for factor analysis with a figure of 0.791, which was more than the accepted benchmark of 0.5, showing that the chosen variables could possibly possess a coherent underlying structure. Moreover, Bartlett's Test of Sphericity was conducted, and it yielded a very significant p-value of 0.000, which signifies the presence of a meaningful relationship between the variables, which supported the suitability of factor analysis. These results together validate the vigor of the data set for factor analysis, showing that it is well-placed for uncovering latent factors and interactions among the variables.

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | .791 |
|--|--------------------|-------------|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1224.200 |
| | df | 66 |
| | Sig. | .000 |
| a. Based on correlations | | |

Table 1: KMO and Bartlett's Test
Source: Author's Computation, 2024

4. Results

Table 2 above shows an overview of the respondents' demographic data in terms of gender, age, education, and industry. In terms of gender, the majority of respondents were male, representing 68.77% of the total population, while females accounted for 31.23% of the sample. In terms of age distribution, the highest proportion falls within ages 25 and 35, which constituted 45.36% of the respondents, followed by the 36-50 age group at 25.56% and those above 50 years at 29.47%. Regarding education, a significant part of the respondents held postgraduate (PG) qualifications, which made up 50.88%, while 30.53% of the respondents held undergraduate degrees, and 18.60% fell into the category of "others". Eventually, with respect to the industry, IT was the most dominant sector among respondents at 38.60%, followed by ITES at 26.67%, service at 22.46, and the manufacturing sector at 12.28%. These demographic characteristics provide a detailed understanding of the respondent sample, which is vital for contextualizing and interpreting the research discoveries within particular demographic groups.

| Demographic Variable | Category | No. of Respondents | % of Respondents |
|----------------------|---------------|--------------------|------------------|
| Gender | Male | 196 | 68.77 |
| | Female | 89 | 31.23 |
| Age | 25-35 | 129 | 45.26 |
| | 36-50 | 72 | 25.26 |
| | Above 50 | 84 | 29.47 |
| Education | UG | 87 | 30.53 |
| | PG | 145 | 50.88 |
| | Others | 53 | 18.60 |
| Industry | IT | 110 | 38.60 |
| | ITES | 76 | 26.67 |
| | Manufacturing | 35 | 12.28 |
| | Service | 64 | 22.46 |

Table 2: Results of Demographics
Source: Author's Computation, 2024

The AMOS software, version 24, was used to apply the Structural Equation Model (SEM) method and examine the proposed conceptual model (Anderson & Gerbing, 2018). This methodology helps in the examination of the relationship between the AI application aspects (recruitment, performance management, and employee satisfaction are considered independent variables) and the AI software solutions in HRM (treated as the dependent variable), which allows for a detailed analysis of their interrelationship.

| Hypothesis | Path | Std. Co-efficient | p-Value | R ² |
|------------|---|-------------------|---------|----------------|
| H1 | Automated Sourcing ← AI software solutions in HRM | 0.718 | *** | 0.382 |
| H2 | Virtual Assisting ← AI software solutions in HRM | 0.542 | *** | |
| H3 | Predictive Analysis ← AI software solutions in HRM | 0.744 | *** | |
| H4 | Market Insights ← AI software solutions in HRM | 0.677 | *** | |
| H5 | Performance Metrics ← AI software solutions in HRM | 0.736 | *** | 0.314 |
| H6 | Performance Prediction Metrics ← AI software solutions in HRM | 0.751 | *** | |
| H7 | Employee Engagement Analysis ← AI software solutions in HRM | 0.729 | *** | |
| H8 | Team Dynamic Analysis ← AI software solutions in HRM | 0.633 | *** | 0.390 |
| H9 | Personalized Learning ← AI software solutions in HRM | 0.592 | *** | |
| H10 | Employee Well-being ← AI software solutions in HRM | 0.668 | *** | |
| H11 | Tailored Career Pathing ← AI software solutions in HRM | 0.856 | *** | |
| H12 | Predictive Employee Insights ← AI software solutions in HRM | 0.803 | *** | |

Table 3: Conceptual Model Results
Source: Author's Computation, 2024

The displayed hypotheses represent strong statistically relevant relationships between different aspects of human resource practices and the impact of AI software solutions in HRM. Notably, hypotheses H1, H3, H4, H5, H7, H8, H9, H11, and H12 all demonstrate positive and relevant standardization coefficients, showing that factors such as automated sourcing, predictive analysis, market insights, performance metrics, employee engagement analysis, team dynamic analysis, personalized learning, tailored career pathing, and predictive employee insights have a significant positive impact on the impact of AI software solutions in HRM. These findings are in line with the theoretical foundations that suggest AI incorporation in human resource practices is clearly associated with improved recruitment, performance management, employee satisfaction, and overall human resource agility. These strong interrelationships, as shown by the high figures and significant p-values, highlight the critical role of these human resource aspects in driving AI software solutions, thus providing valuable insights for companies seeking to utilize AI for human resource enhancement.

Figure 2 shows three causal relationships between the utilization of artificial intelligence applications and artificial intelligence in human resource management. The beta values and P-values linked with these causal relationships are derived from table 4. All three dimensions of AI applications in human resources show a great and statistically relevant impact on the dependent variable, AI software solutions in HRM, with beta values of 0.382, 0.314, and 0.390, respectively. These observations show a strong impact of these dimensions on AI software solutions in HRM, with correlating beta values of 0.48, 0.34, and 0.19, showing their relevance.

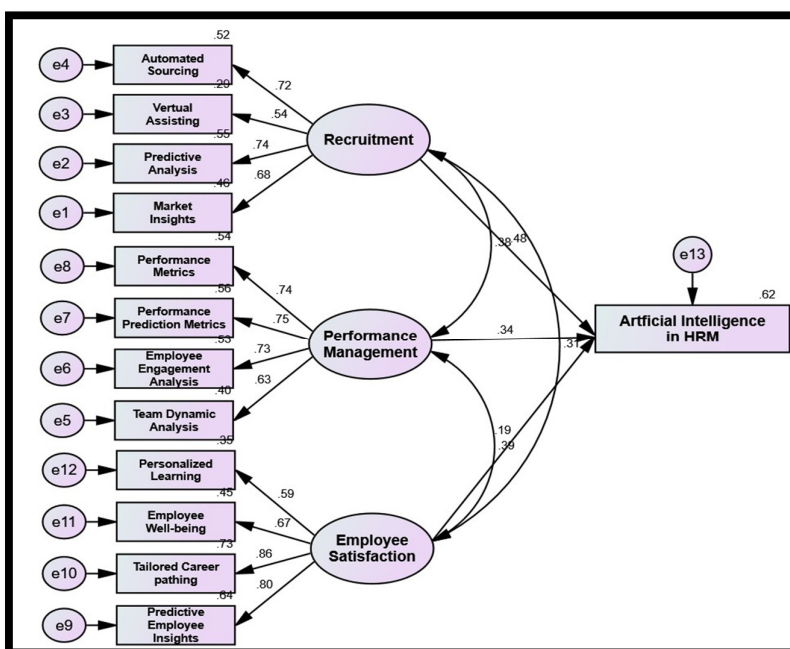


Figure 2: Hypothesized Conceptual Model

| CMIN/DF | RMSEA | CFI | IFI | GFI | AGFI | RFI |
|---------|-------|-------|-------|-------|-------|-------|
| 3.369 | 0.71 | 0.901 | 0.903 | 0.827 | 0.872 | 0.867 |
| >5.0 | <0.8 | >0.90 | >0.90 | >0.90 | >0.90 | >0.90 |

Table 4: Fit Indices of the Conceptual Model

As shown in table 4, fit indices for the structural equation model are thus: CMIN/DF is 3.369, showing a reasonable fit; RMSEA is 0.71, which exceeds the recommended threshold slightly but suggests a need for model enhancement; CFI is at 0.901, which met the standard for a good fit; IFI is 0.903, which indicates good fit; GFI is 0.827, which fell below the threshold, showing that there is room for advancement; AGFI is 0.872, which is slightly below the standardized threshold; and RFI is 0.867, which also falls slightly below the standardized threshold. Altogether, these indices show valuable insights into the model fit, with some showing a good fit while others suggest prospects for model advancement, stressing the need for further assessment and possible fine-tuning to establish a more satisfactory fit to the analyzed data.

5. Conclusion

The analysis shown in this research offers intense insights into the complex relationships between various aspects of human resource management and the impact of artificial intelligence software solutions on human resources. The findings show that AI plays a crucial role in revolutionizing human resource practices and fostering employee engagement and retention. Automated sourcing, predictive analysis, market insights, virtual assistance, performance metrics, employee engagement, team dynamics, personalized learning, predictive employee insights, and tailored career pathing all show relevant and positive correlations with the impact of AI software solutions in human resources. These robust correlations emphasize the profound influence of AI on human resource management, suggesting that businesses utilizing AI across the human resource spectrum are well-positioned to improve recruitment, enhance performance management, and improve employee satisfaction. This all-inclusive incorporation of artificial intelligence not only shows a progressive shift in human resource practices but also underscores the strategies for organizations to utilize AI's potential in human resources to steer the dynamic landscape of workforce optimization, employee engagement, and talent acquisition, ultimately carving a more competitive and agile organizational future. However, while these findings offer invaluable insights, future studies can further examine the complex dynamics and contextual aspects that affect AI adoption in HRM, clearing the path for more effective and efficient HRM strategies in the age of artificial intelligence.

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