

ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT AND ITS IMPACT ON EMPLOYEE PERFORMANCE

Dr. M. RAJEE¹, M. JAMUNA RANI²

¹Associate Professor, Department of Business Administration, Kamaraj College (Autonomous), Thoothukudi. (Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamilnadu)

²Assistant Professor, Department of Business Administration, Kamaraj College (Autonomous), Thoothukudi. (Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamilnadu)

Abstract: Artificial Intelligence (AI) has emerged as an important technological innovation in Human Resource Management (HRM), transforming traditional HR practices such as recruitment, employee selection, performance evaluation, training, workforce planning and employee engagement. The application of AI enables organisations to automate routine HR activities, analyse large volumes of employee data and support managers in making faster and more informed decisions. The present study examines the role of Artificial Intelligence in Human Resource Management and its impact on employee performance. The study adopts a descriptive and analytical research design and collects primary data from 277 respondents through a structured questionnaire. The major dimensions considered for AI-enabled HRM are AI-enabled recruitment and selection, AI-enabled training and development, AI-based performance management, employee data analytics and AI-enabled employee engagement. Factor analysis is proposed to identify the underlying dimensions of AI adoption in HRM, while Structural Equation Modelling (SEM) using AMOS is proposed to examine the relationship between AI-enabled HRM practices and employee performance. The study is expected to demonstrate that effective implementation of AI in HRM can improve work efficiency, decision-making, productivity and employee performance, provided that organisations address issues related to transparency, privacy, employee acceptance and technological skills.

Keywords: Artificial Intelligence, Human Resource Management, Employee Performance, AI-enabled HRM, Factor Analysis, Structural Equation Modelling, AMOS

1. Introduction

Human Resource Management plays a significant role in developing and maintaining an organisation's workforce. Traditionally, HR activities have involved substantial manual work, including recruitment, employee record management, attendance monitoring, performance appraisal, training administration and employee communication. The rapid development of Artificial Intelligence has created new opportunities for organisations to automate and improve these activities.

Artificial Intelligence refers to the ability of computer systems to perform tasks that normally require human intelligence, such as learning, prediction, classification, language processing and decision-making. In HRM, AI can be applied to screen job applications, identify suitable candidates, personalise employee training, analyse performance information, predict workforce requirements and respond to employee queries through intelligent systems.

The adoption of AI can potentially improve the speed and accuracy of HR processes while reducing repetitive administrative work. It can also provide HR managers with data-driven insights that support workforce planning and



employee development. However, AI adoption may also create challenges involving employee privacy, algorithmic bias, lack of transparency, job insecurity and resistance to technological change.

Employee performance is an important indicator of organisational effectiveness. Employees who receive appropriate training, timely feedback, effective support and suitable opportunities for development are more likely to perform their duties efficiently. Therefore, understanding whether AI-based HR practices contribute to improved employee performance is important for organisations implementing digital HR transformation.

The present study therefore focuses on the relationship between Artificial Intelligence in Human Resource Management and employee performance. It examines the major AI-enabled HR practices and investigates their influence on employee performance through factor analysis and Structural Equation Modelling using AMOS.

Objectives of the Study

- 1. To identify the major dimensions of Artificial Intelligence adoption in Human Resource Management.**
- 2. To examine the impact of AI-enabled HRM practices on employee performance.**
- 3. To develop and validate an SEM model explaining the relationship between AI-enabled HRM practices and employee performance.**

2. REAVIEW OF LITRATURE

Madancian and Taherdoost (2024), in their study titled “The Impact of Artificial Intelligence on Human Resource Management: Opportunities and Challenges,” examined the transformative role of Artificial Intelligence (AI) in Human Resource Management (HRM). The study highlighted that AI can enhance HR functions such as recruitment, employee onboarding, performance evaluation, talent management and strategic workforce planning by automating processes and providing data-driven insights for decision-making. At the same time, the authors identified several challenges associated with AI adoption, including ethical concerns, algorithmic bias, data privacy, security risks and the possible reduction of human interaction in HR practices. The study emphasized the importance of maintaining a balance between technological advancement and the human element in HRM. It concluded that effective collaboration among employers, HR professionals and researchers is essential to ensure that AI improves the efficiency, fairness and productivity of workplaces while preserving human-centred decision-making.

Vrontis, Christofi, Pereira, Tarba, Makrides and Trichina (2022), in their study titled “Artificial Intelligence, Robotics, Advanced Technologies and Human Resource Management: A Systematic Review,” systematically examined the role and impact of Artificial Intelligence, robotics and other advanced technologies in Human Resource Management. Based on a systematic review of 13,136 potentially relevant studies, the authors identified 45 articles focusing on intelligent automation within HRM. The study found that AI and related technologies create significant opportunities for improving HRM strategies and organisational performance through enhanced decision-making, human–AI collaboration, learning opportunities, recruitment, training and employee performance management. However, the study also highlighted important technological and ethical challenges, particularly concerning job replacement and the changing relationship between humans and intelligent technologies. The authors concluded that intelligent automation is transforming traditional HRM practices and recommended further research to understand its effects at both organisational and individual employee levels.

Biliavska, Castanho and Vulevic (2022), in their study on Artificial Intelligence and its importance in Human Resource practices, examined the growing role of AI in modern HRM and its potential to improve organisational effectiveness. The study explained that AI involves computer systems capable of performing functions associated with human intelligence, such as acquiring information, perception, reasoning and decision-making. Using a qualitative phenomenological research approach, the study explored the significance and application of AI in contemporary HR practices. The findings indicated that AI-based HR applications can improve employee productivity and support HR professionals in becoming more effective strategic advisers. AI-enabled HR solutions can also assist organisations in evaluating, predicting and diagnosing employee capabilities and identifying talented and competent employees. The

study concluded that the effective integration of AI into HRM can strengthen employee performance and productivity while enabling HR professionals to make better-informed decisions regarding talent and workforce management.

3. Research Methodology

3.1 Research Design

The study adopts a **descriptive and analytical research design**. The descriptive component explains the level of AI adoption in HRM, while the analytical component examines the relationship between AI-enabled HR practices and employee performance.

3.2 Population of the Study

The population comprises employees working in organisations where digital technologies or AI-supported HR practices are used or are being introduced.

3.3 Sample Size

A total of **277 respondents** are considered for the study. The respondents are selected using a suitable sampling technique, such as convenience sampling or purposive sampling, depending on the accessibility of employees and the research setting.

3.4 Sources of Data

Primary data: Primary data are collected from employees through a structured questionnaire using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

Secondary data: Secondary information is collected from books, research articles, journals, reports and other relevant academic sources relating to Artificial Intelligence, Human Resource Management and employee performance.

3.5 Statistical Tools

The following statistical techniques may be employed:

- Percentage analysis
- Descriptive statistics
- Reliability analysis using Cronbach's Alpha
- Kaiser-Meyer-Olkin (KMO) and Bartlett's Test
- Exploratory Factor Analysis (EFA)
- Confirmatory Factor Analysis (CFA)
- Structural Equation Modelling (SEM) using AMOS

3.6 Variables Considered for the Study

The independent construct is **AI-enabled Human Resource Management**, represented by the following dimensions:

1. AI-enabled Recruitment and Selection
2. AI-enabled Training and Development

3. AI-based Performance Management
4. Employee Data Analytics
5. AI-enabled Employee Engagement

The dependent construct is:

Employee Performance

Employee performance may be measured through indicators such as:

- Productivity
- Quality of work
- Task efficiency
- Achievement of targets
- Timely completion of work
- Adaptability to change

4. Questionnaire Dimensions for Factor Analysis

The questionnaire may contain statements measuring the following dimensions.

Factor 1: AI-enabled Recruitment and Selection

- AI helps HR departments screen applications efficiently.
- AI assists in identifying suitable candidates.
- AI reduces the time required for recruitment.
- AI improves the accuracy of candidate selection.
- AI-supported recruitment provides useful candidate information.

Factor 2: AI-enabled Training and Development

- AI helps identify employees' training needs.
- AI provides personalised learning recommendations.
- AI makes training programmes more accessible.
- AI helps employees develop relevant skills.
- AI supports continuous employee learning.

Factor 3: AI-based Performance Management

- AI helps monitor employee performance.

- AI provides timely performance information.
- AI supports objective performance evaluation.
- AI helps identify areas requiring improvement.
- AI facilitates continuous performance feedback.

Factor 4: Employee Data Analytics

- AI helps HR managers analyse employee information.
- AI supports data-driven HR decision-making.
- AI helps identify workforce trends.
- AI improves workforce planning.
- AI provides useful insights into employee behaviour.

Factor 5: AI-enabled Employee Engagement

- AI-enabled HR systems improve employee communication.
- AI helps employees obtain HR information quickly.
- AI-based systems improve employee support.
- AI contributes to a better employee experience.
- AI makes HR services more convenient.

Employee Performance

- I complete my assigned tasks efficiently.
- I consistently achieve my work targets.
- The quality of my work is high.
- I complete my work within the required time.
- I am able to adapt to changes in my work environment.
- I am productive in my job.

5. Factor Analysis

Factor analysis can be used to identify the underlying dimensions of AI-enabled HRM from the responses of the 277 employees. Before conducting factor analysis, the adequacy of the data should be assessed using the **Kaiser-Meyer-Olkin (KMO) measure** and **Bartlett's Test of Sphericity**.

A KMO value above 0.50 indicates that the data are suitable for factor analysis, while a statistically significant Bartlett's test indicates that the correlation matrix is appropriate for factor extraction. Factors may be extracted using Principal Component Analysis or Principal Axis Factoring, followed by Varimax rotation where appropriate.

The expected factor structure consists of five major dimensions: **AI-enabled Recruitment and Selection, AI-enabled Training and Development, AI-based Performance Management, Employee Data Analytics and AI-enabled Employee Engagement.**

Items with factor loadings of approximately **0.50 or above** may generally be considered satisfactory, although the final decision should also consider communalities, cross-loadings and theoretical relevance.

Expected Factor Structure

Factor	Dimension	Expected Indicators
F1	AI-enabled Recruitment and Selection	5
F2	AI-enabled Training and Development	5
F3	AI-based Performance Management	5
F4	Employee Data Analytics	5
F5	AI-enabled Employee Engagement	5
DV	Employee Performance	6

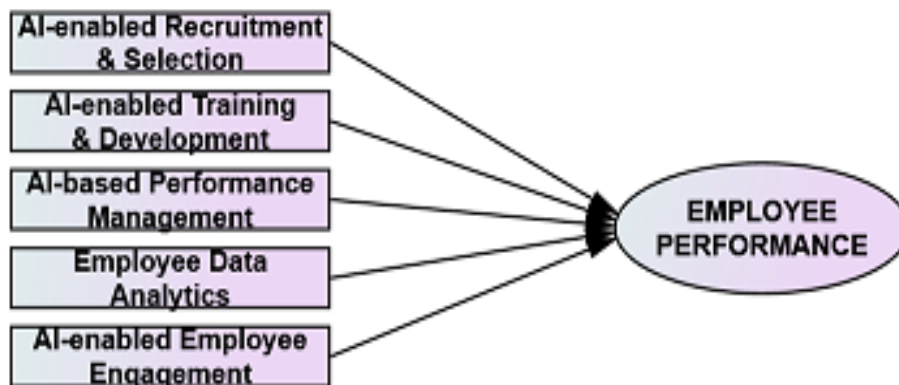
The reliability of each construct should be evaluated using Cronbach's Alpha. A coefficient of approximately **0.70 or above** is generally considered acceptable for established research scales.

6. Structural Equation Modelling Using AMOS

Structural Equation Modelling is used to examine the direct effect of AI-enabled HRM practices on employee performance. AMOS can be used to estimate both the measurement model and the structural model.

6.1 Proposed SEM Model

The proposed model assumes that the five dimensions of AI-enabled HRM positively influence employee performance.



6.2 AMOS Model Interpretation

In AMOS, each of the five AI-enabled HRM dimensions can be specified as a latent construct measured by its respective questionnaire items. Employee Performance is specified as the dependent latent construct.

The model can therefore be represented as:

AI-enabled HRM dimensions → Employee Performance

The structural paths to be tested are:

- H1: AI-enabled Recruitment and Selection has a significant positive effect on Employee Performance.
- H2: AI-enabled Training and Development has a significant positive effect on Employee Performance.
- H3: AI-based Performance Management has a significant positive effect on Employee Performance.
- H4: Employee Data Analytics has a significant positive effect on Employee Performance.
- H5: AI-enabled Employee Engagement has a significant positive effect on Employee Performance.

6.3 Model Fit Indices

The adequacy of the proposed SEM model should be evaluated using commonly reported fit indices such as:

Fit Index	General Guideline
CMIN/DF	Preferably below 3
GFI	≥ 0.90
AGFI	≥ 0.90
CFI	≥ 0.90
TLI	≥ 0.90
RMSEA	≤ 0.08
SRMR	≤ 0.08

These values are **recommended assessment guidelines, not results of the present study**. The actual values should be obtained from the AMOS output after the model is estimated using the 277 responses.

7. Hypotheses of the Study

H1: AI-enabled Recruitment and Selection has a significant positive influence on employee performance.

H2: AI-enabled Training and Development has a significant positive influence on employee performance.

H3: AI-based Performance Management has a significant positive influence on employee performance.

H4: Employee Data Analytics has a significant positive influence on employee performance.

H5: AI-enabled Employee Engagement has a significant positive influence on employee performance.

8. Expected Findings and Discussion

The study is expected to show that AI-enabled HRM practices have a meaningful relationship with employee performance. AI-supported recruitment may improve the identification of suitable employees, while AI-based training systems may provide personalised learning opportunities. AI-based performance management can facilitate continuous monitoring and feedback, allowing employees to understand their strengths and areas for improvement.

Employee data analytics can support evidence-based decision-making and help organisations identify workforce trends. Similarly, AI-enabled employee engagement systems can improve communication and access to HR services. Collectively, these practices may contribute to higher productivity, better work quality, improved efficiency and greater adaptability among employees.

However, the effectiveness of AI does not depend only on technological implementation. Employee acceptance, managerial support, transparency, training and trust in AI-based systems are also important. Organisations should therefore view AI as a tool that supports HR professionals rather than completely replacing human judgement.

9. Suggestions of the Study

1. Organisations should introduce AI into HRM gradually and align AI adoption with organisational objectives.
2. Employees should be provided with adequate training to develop the digital skills required to work effectively with AI-based HR systems.
3. HR departments should maintain human oversight when AI is used for recruitment, performance evaluation and other important employee-related decisions.
4. Organisations should establish clear policies regarding employee data privacy and information security.
5. AI systems used in HR should be regularly evaluated for bias, fairness and accuracy.
6. Employees should be informed about how AI-based systems are used in HR decision-making to increase transparency and trust.
7. AI should be used to support employee development and engagement rather than merely to automate HR activities.
8. Organisations should periodically assess whether AI-enabled HR practices are actually improving employee productivity and performance.

10. Limitations of the Study

The study has certain limitations. First, the sample is restricted to **277 respondents**, and therefore the findings may not represent all employees or organisations. Second, the study relies mainly on employees' perceptions collected through a questionnaire, which may involve response bias. Third, the study focuses on selected dimensions of AI-enabled HRM and may not cover every application of Artificial Intelligence in HR. Fourth, differences in organisational size, industry, technology infrastructure and employee digital literacy may influence the effectiveness of AI-based HR practices. Finally, the study is primarily cross-sectional, and therefore it may not fully capture the long-term impact of AI adoption on employee performance.

11. Conclusion

Artificial Intelligence is increasingly becoming an important component of modern Human Resource Management. The application of AI in recruitment, training, performance management, employee analytics and engagement can transform conventional HR practices and provide organisations with faster, data-driven and efficient HR processes. The present study, based on **277 respondents**, proposes an empirical framework for examining the impact of AI-enabled HRM on employee performance through factor analysis and Structural Equation Modelling using AMOS.

The proposed model considers five major dimensions of AI-enabled HRM and examines their influence on employee performance. The study emphasises that AI can contribute to improved productivity, work quality, efficiency and adaptability when it is implemented appropriately. At the same time, organisations need to address concerns relating to privacy, transparency, employee acceptance, bias and technological capability. Therefore,

successful AI adoption in HRM should combine technological capability with human judgement and employee-centred management practices.

Overall, Artificial Intelligence should be viewed not simply as an automation technology but as a strategic HR tool capable of supporting better decisions, employee development and organisational performance. Effective integration of AI with human expertise can help organisations create a more efficient, responsive and future-ready workforce.

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