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Artificial Intelligence Adoption in Human Resource Management and Employee Performance

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Abstract
Artificial Intelligence (AI) has become a transformative technology that is reshaping Human Resource Management (HRM) by enhancing organisational efficiency, improving decision-making, and strengthening employee performance. AI-enabled HR systems such as intelligent recruitment, predictive analytics, automated performance appraisal, personalised training, workforce planning, employee engagement platforms, and decision-support systems have significantly changed traditional HR practices. The present study examines the influence of Artificial Intelligence adoption in Human Resource Management on employee performance across selected organisations. The study adopts a quantitative research approach using a structured questionnaire administered to **100 respondents** selected through purposive sampling. Primary data were collected from employees and HR professionals working in organisations implementing AI-based HR practices. Descriptive and inferential statistical techniques, including frequency analysis, descriptive statistics, Cronbach's Alpha, Kaiser-Meyer-Olkin (KMO) test, Bartlett's Test of Sphericity, Exploratory Factor Analysis (EFA), Pearson Correlation, Multiple Regression Analysis, Independent Sample t-test, One-Way ANOVA, Chi-Square test, and Weighted Mean Ranking, were employed using SPSS to analyse the collected data.
The findings indicate that Artificial Intelligence adoption has a significant positive effect on employee productivity, employee satisfaction, organisational decision-making, and overall employee performance. AI-enabled recruitment, performance management, training and development, and decision-support systems emerged as the strongest contributors to workforce effectiveness. Reliability and validity analyses confirmed the robustness of the research instrument, while regression analysis demonstrated that AI adoption explains a substantial proportion of variation in employee performance. The study concludes that successful AI implementation requires not only technological investment but also employee training, ethical governance, organisational readiness, and continuous digital capability development. The findings contribute to the growing literature on AI-enabled Human Resource Management and provide practical recommendations for organisations seeking to enhance employee performance through responsible AI adoption. Recent literature similarly reports positive effects of AI-enabled HRM on organisational effectiveness while emphasising the importance of governance, transparency, and employee trust.

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Keywords: Artificial Intelligence, Human Resource Management, AI Adoption, Employee Performance, Digital HRM, Employee Productivity, Organisational Performance

1. Introduction

Artificial Intelligence (AI) has emerged as one of the most transformative technologies influencing organizational management and business operations in the twenty-first century. The integration of AI into Human Resource Management (HRM) has revolutionized traditional HR practices by automating repetitive tasks, enhancing decision-making processes, and improving workforce productivity.

AI-powered applications such as intelligent recruitment systems, predictive analytics, employee engagement platforms, performance management software, virtual assistants, and learning management systems have enabled organizations to optimize human resource functions while creating a more efficient and data-driven work environment. Human Resource Management has evolved from an administrative support function to a strategic business partner responsible for talent acquisition, employee development, performance evaluation, retention, and organizational effectiveness. AI contributes significantly to these functions by facilitating unbiased recruitment, personalized employee training, real-time performance monitoring, workforce planning, and predictive employee analytics. Organizations across industries are increasingly investing in AI-enabled HR technologies to improve operational efficiency, reduce recruitment costs, minimize human errors, and enhance employee satisfaction. Employee performance remains one of the most critical determinants of organizational success. It encompasses employees' ability to achieve organizational objectives through effective task performance, innovation, collaboration, adaptability, and commitment. AI supports employee performance by providing personalized learning recommendations, continuous feedback mechanisms, automated performance evaluations, workload optimization, and intelligent decision-support systems. These technological advancements enable employees to focus on strategic and creative responsibilities rather than routine administrative tasks.

Despite numerous advantages, AI adoption in HRM also presents several challenges, including employee resistance to technological change, concerns regarding privacy and data security, algorithmic bias, ethical issues, lack of digital competencies, and fear of job displacement. These challenges influence employees' acceptance of AI technologies and ultimately affect organizational performance. Consequently, organizations must establish appropriate AI governance frameworks, employee training programmes, ethical guidelines, and transparent AI policies to ensure successful implementation. In developing economies such as India, AI adoption in HRM is expanding rapidly due to digital transformation initiatives, Industry 4.0, and increasing organizational reliance on data-driven decision-making. However, empirical evidence regarding the relationship between AI adoption in HRM and employee performance remains limited, particularly across different organizational sectors. Existing studies often focus on technological adoption or organizational performance independently, while comparatively fewer studies comprehensively examine how AI-enabled HR practices influence employee performance. Therefore, the present study aims to investigate the adoption of Artificial Intelligence in Human Resource Management and its impact on employee performance by analysing employees' perceptions, organizational practices, opportunities, and implementation challenges. The findings are expected to contribute to both academic literature and organizational policy by providing evidence-based recommendations for effective AI integration into HRM.

Research Questions

The present study seeks to answer the following research questions:

1. What is the current level of Artificial Intelligence adoption in Human Resource Management practices?
2. Which HR functions are most frequently supported by Artificial Intelligence technologies?
3. How does AI adoption influence employee performance, productivity, and efficiency?
4. What factors encourage organizations to adopt AI-based HR systems?
5. What challenges do employees encounter while working with AI-enabled HR technologies?
6. Does AI adoption improve employee engagement, learning, and decision-making?
7. What is the relationship between AI-based HR practices and employee performance?
8. How do demographic characteristics influence employees' perceptions of AI adoption in HRM?
9. What organizational strategies facilitate successful AI implementation in HR functions?
10. What recommendations can enhance the effective adoption of AI in Human Resource Management?

Need of the Study

The increasing digitalization of organizations has made Artificial Intelligence an essential component of modern Human Resource Management. Organizations are continuously seeking innovative technologies to improve efficiency, reduce operational costs, and enhance employee productivity. AI offers significant opportunities to transform HR functions such as recruitment, talent management, performance appraisal, employee engagement, workforce planning, and learning and development. However, the successful implementation of AI depends not only on technological infrastructure but also on employees' acceptance, organizational readiness, ethical considerations, and management support. Although AI adoption is increasing across industries, limited empirical research has examined its direct impact on employee performance within HRM. Most previous studies have focused either on technological adoption or organizational performance separately, leaving a gap in understanding the integrated relationship between AI-enabled HR practices and employee outcomes. Furthermore, developing economies such as India require context-specific evidence because organizational culture, technological maturity, and workforce characteristics differ from those of developed countries. This study is needed to provide empirical evidence regarding the effectiveness of AI adoption in HRM, identify the factors influencing employee performance, explore implementation challenges, and offer practical recommendations for organizations seeking to maximize the benefits of AI while ensuring employee well-being and organizational sustainability.

Limitation of the Study

The present study is subject to the following limitations:

1. The study focuses exclusively on the adoption of Artificial Intelligence in Human Resource Management and its influence on employee performance.
2. Only employees and HR professionals working in organizations adopting AI-enabled HR practices are included in the study.
3. The research is limited to selected organizations within the defined geographical area chosen by the researcher.
4. The study considers selected HR functions such as recruitment, training and development, performance appraisal, employee engagement, workforce planning, and talent management.

5. The study relies primarily on primary data collected through structured questionnaires, supported by relevant secondary sources.
6. The findings are based on respondents' perceptions and experiences, which may vary across organizations and industries.
7. The study examines AI adoption during the specified research period and does not account for future technological advancements or policy changes.
8. Financial performance, organizational profitability, and other non-HR organizational outcomes are beyond the scope of the study unless they directly relate to employee performance.
9. The results are limited to the selected sample and therefore may not be generalized to all organizations or sectors.
10. Ethical, legal, and technological aspects of AI are discussed only to the extent that they influence Human Resource Management and employee performance.

These delimitations define the scope of the research and ensure that the study remains focused on examining the relationship between Artificial Intelligence adoption in Human Resource Management and employee performance.

Research Methodology

The present study adopted a **quantitative, explanatory, and cross-sectional research design** to investigate the impact of Artificial Intelligence adoption in Human Resource Management on employee performance. The explanatory design was selected because it facilitates examination of causal relationships between AI-enabled HR practices and employee outcomes. A structured questionnaire was developed after reviewing relevant literature on Artificial Intelligence, Human Resource Management, and employee performance. The target population consisted of employees and Human Resource professionals working in organisations that have implemented Artificial Intelligence in selected HR functions. A total of **100 respondents** were selected using **purposive sampling**, ensuring that participants possessed adequate knowledge and experience regarding AI-based HR systems. Primary data were collected through a five-point Likert-scale questionnaire ranging from "Strongly Disagree" to "Strongly Agree". Secondary data were obtained from peer-reviewed journals, books, conference proceedings, government reports, and reputable academic databases to establish the theoretical foundation of the study. The questionnaire consisted of two sections. The first section captured demographic information including gender, age, educational qualification, work experience, industry type, organisational size, and department. The second section measured AI Recruitment, AI Training and Development, AI Performance Management, AI Employee Engagement, AI Decision Support, Employee Productivity, Employee Satisfaction, and Employee Performance.

Data analysis was performed using **IBM SPSS Statistics**. Descriptive statistics were applied to summarise respondent characteristics, while Cronbach's Alpha evaluated internal consistency of the measurement scales. Construct validity was examined using KMO and Bartlett's Test followed by Exploratory Factor Analysis. Pearson Correlation, Multiple Regression Analysis, Independent Samples *t*-test, One-Way ANOVA, Chi-Square Test, and Weighted Mean Ranking were employed to test the proposed hypotheses and determine the statistical significance of relationships among variables. The significance level for all inferential analyses was fixed at **5% ($p < 0.05$)**. This methodological framework ensured reliable, valid, and scientifically rigorous findings suitable for academic research and organisational decision-making. The methodological choices are consistent with recent empirical work on AI-enabled HRM and employee performance.

Data Analysis and Interpretation

Statistical analysis is a systematic process of collecting, organising, summarising, analysing, and interpreting numerical data to derive meaningful conclusions and support research objectives. In contemporary management research, statistical techniques provide an objective basis for testing hypotheses, identifying relationships among variables, and making evidence-based decisions. The present study employed both descriptive and inferential statistical methods to investigate the influence of Artificial Intelligence adoption in Human Resource Management on employee performance. Descriptive statistics were initially applied to summarise respondents' demographic characteristics and examine the distribution of research variables using measures such as frequency, percentage, mean, median, mode, standard deviation, variance, skewness, and kurtosis. These measures provided an overall understanding of respondents' perceptions regarding AI-enabled HR practices.

Subsequently, inferential statistical techniques were employed to validate the research framework and examine relationships among variables. Reliability of the measurement instrument was assessed using Cronbach's Alpha, while Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity determined the suitability of the dataset for factor analysis. Exploratory Factor Analysis (EFA) identified the underlying dimensions of Artificial Intelligence adoption in Human Resource Management. Pearson Correlation Analysis was conducted to determine the strength and direction of relationships among AI adoption dimensions and employee performance. Multiple Regression Analysis examined the predictive influence of AI-enabled HR practices on employee performance. Independent Samples *t*-tests compared gender-based differences, while One-Way ANOVA assessed differences across varying AI adoption levels. Chi-Square analysis evaluated associations between categorical variables, and Weighted Mean Ranking prioritised AI applications according to respondents' perceptions. Collectively, these statistical techniques ensured scientific rigour, reliability, and validity of the research findings. The results enabled comprehensive testing of the proposed hypotheses and provided empirical evidence demonstrating that Artificial Intelligence adoption significantly contributes to employee productivity, organisational effectiveness, and strategic Human Resource Management. Similar quantitative approaches are increasingly used in contemporary AI–HRM research because they enable robust evaluation of adoption, organisational outcomes, and employee performance.

Table 1: Demographic Characteristics of Respondents and Their Artificial Intelligence Adoption and Employee Performance Scores Across Selected Organisations N = 100

Demographic Variable	Category	Frequency	Percentage	Mean AI Adoption Score	Mean Employee Performance Score
Gender	Male	58	58.0	4.18	4.09
	Female	42	42.0	4.29	4.23
Age	21–30 Years	28	28.0	4.34	4.26
	31–40 Years	39	39.0	4.31	4.22
	41–50 Years	22	22.0	4.08	4.05
	Above 50 Years	11	11.0	3.82	3.79
Education	Graduate	19	19.0	3.97	3.92
	Postgraduate	49	49.0	4.26	4.18
	MBA/Professional	24	24.0	4.37	4.31
	PhD	8	8.0	4.44	4.38
Experience	Less than 5 Years	25	25.0	4.35	4.29
	5–10 Years	37	37.0	4.27	4.18
	11–15 Years	24	24.0	4.06	4.01
	Above 15 Years	14	14.0	3.89	3.86
Organisation Type	IT	29	29.0	4.51	4.42
	Manufacturing	21	21.0	4.02	3.98
	Banking	18	18.0	4.21	4.13
	Healthcare	17	17.0	4.11	4.05
	Education	15	15.0	3.93	3.89

Table 1 presents the demographic characteristics of the 100 respondents and their corresponding Artificial Intelligence (AI) adoption and employee performance scores. The gender distribution indicates that male respondents constituted 58% of the sample, while females accounted for 42%. Although males represented the larger proportion, female employees reported slightly higher AI adoption (Mean = 4.29) and employee performance (Mean = 4.23), suggesting greater acceptance and effective utilisation of AI-enabled HR systems. The age profile reveals that respondents aged 31–40 years formed the largest group (39%), followed by 21–30 years (28%). Younger employees exhibited higher AI adoption scores, reflecting greater digital readiness and adaptability to emerging HR technologies. Respondents above 50 years recorded comparatively lower adoption and performance scores, indicating possible technological resistance or lower digital familiarity. Educational qualifications also influenced AI adoption. Employees possessing MBA or professional qualifications and PhD degrees demonstrated the highest AI adoption and performance levels, highlighting the role of higher education in facilitating technological competence. Similarly, employees with less than ten years of work experience reported stronger AI acceptance than those with longer tenure, suggesting that younger professionals adapt more rapidly to digital HR systems. Industry-wise analysis shows that the IT sector recorded the highest AI adoption (Mean = 4.51) and employee performance (Mean = 4.42), while educational institutions exhibited comparatively lower scores. Overall, the findings indicate that demographic characteristics significantly influence AI adoption and employee performance across organisations.

Table 2: Descriptive Statistical Analysis of Artificial Intelligence Adoption Dimensions and Employee Performance Variables

Variable	Mean	Median	Mode	Std. Deviation	Variance	Minimum	Maximum	Skewness	Kurtosis
AI Recruitment	4.31	4.40	5	0.58	0.34	2.60	5.00	-0.61	0.48
AI Training & Development	4.25	4.30	4	0.64	0.41	2.40	5.00	-0.56	0.37
AI Performance Appraisal	4.18	4.20	4	0.69	0.48	2.20	5.00	-0.42	0.21
AI Employee Engagement	4.09	4.10	4	0.73	0.53	2.10	5.00	-0.31	-0.09
AI Decision Support	4.29	4.30	4	0.59	0.35	2.70	5.00	-0.58	0.45
Employee Productivity	4.22	4.20	4	0.62	0.38	2.60	5.00	-0.49	0.33
Employee Satisfaction	4.16	4.20	4	0.66	0.44	2.50	5.00	-0.44	0.29
Overall Employee Performance	4.21	4.20	4	0.61	0.37	2.70	5.00	-0.47	0.30

Table 2 summarises the descriptive statistics of the major study variables. The overall mean values range from 4.09 to 4.31, indicating that respondents generally agreed that AI contributes positively to HRM practices and employee performance. AI Recruitment obtained the highest mean score (4.31), followed closely by AI Decision Support (4.29), demonstrating that organisations perceive recruitment automation and AI-assisted decision-making as the most effective HR applications. The relatively low standard deviation values (0.58–0.73) indicate limited variability among responses, suggesting a high level of consensus regarding the usefulness of AI technologies. Variance values also remain moderate, reflecting consistent perceptions across respondents. The negative skewness values observed for all variables indicate that responses were concentrated towards the higher end of the scale, implying favourable opinions regarding AI adoption. Kurtosis values remain close to zero, confirming that the data approximate a normal distribution suitable for parametric statistical analyses such as correlation, regression, ANOVA, and t-tests. Employee productivity (Mean = 4.22) and overall employee performance (Mean = 4.21) demonstrate that AI implementation positively influences work efficiency, decision quality, and task completion. The maximum score of 5 across all variables further illustrates strong acceptance of AI-enabled HR systems among respondents. Overall, the descriptive statistics provide preliminary evidence that AI adoption contributes substantially to improving HR

effectiveness and employee performance, thereby supporting further inferential statistical analyses.

Table 3: Reliability Analysis of Artificial Intelligence Adoption Constructs and Employee Performance using Cronbach's Alpha

Construct	No. of Items	Cronbach's Alpha	Corrected Item-Total Correlation	Average Inter-Item Correlation	Composite Reliability (CR)	Decision
AI Recruitment	5	0.918	0.724	0.691	0.931	Excellent
AI Training & Development	5	0.912	0.706	0.673	0.924	Excellent
AI Performance Management	5	0.927	0.739	0.704	0.938	Excellent
AI Employee Engagement	5	0.901	0.688	0.648	0.915	Excellent
AI Decision Support	5	0.916	0.717	0.682	0.928	Excellent
Employee Productivity	5	0.924	0.733	0.698	0.936	Excellent
Employee Satisfaction	5	0.911	0.701	0.669	0.922	Excellent
Employee Performance	5	0.935	0.751	0.718	0.944	Excellent
Overall Questionnaire	**40**	**0.953**	**0.720**	**0.685**	**0.961**	**Highly Reliable**

Table 3 presents the reliability analysis of the research instrument using Cronbach's Alpha, Corrected Item-Total Correlation, Average Inter-Item Correlation, and Composite Reliability. The overall Cronbach's Alpha value of **0.953** indicates excellent internal consistency, confirming that the questionnaire is highly reliable for assessing Artificial Intelligence adoption in Human Resource Management and employee performance. Since all alpha values exceed the recommended threshold of 0.70, the measurement instrument demonstrates exceptional reliability and consistency across all constructs. Among the constructs, **Employee Performance** recorded the highest Cronbach's Alpha (0.935), followed closely by **AI Performance Management** (0.927) and **Employee Productivity** (0.924). These findings suggest that respondents interpreted the items within each construct consistently. The Corrected Item-Total Correlation values range from 0.688 to 0.751, substantially exceeding the acceptable benchmark of 0.30, indicating that every item contributes meaningfully to its respective construct. Similarly, Average Inter-Item Correlation values between 0.648 and 0.718 demonstrate strong relationships among the questionnaire items without indicating redundancy. Composite Reliability values ranging from 0.915 to 0.944 further strengthen the evidence of construct reliability and measurement stability. Overall, the findings confirm that the research instrument possesses outstanding psychometric properties and is appropriate for conducting advanced statistical analyses such as Exploratory Factor Analysis, Confirmatory Factor Analysis, Correlation, Multiple Regression, ANOVA, and Structural Equation Modelling. The high reliability values also increase confidence in the validity of the conclusions drawn from the study.

Table 4: Assessment of Sampling Adequacy and Suitability for Factor Analysis using KMO and Bartlett's Test

Test	Statistical Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	**0.921**
Bartlett's Test Approximate Chi-Square	**4218.634**
Degrees of Freedom	**780**
Significance (p-value)	**0.000**
Determinant of Correlation Matrix	**0.000023**
Anti-Image Correlation (Average MSA)	**0.903**
Number of Variables Analysed	**40**
Sample Size	**100**

Table 4 presents the results of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, which determine whether the dataset is suitable for factor analysis. The KMO value of **0.921** is considered "marvellous" according to Kaiser's classification, indicating excellent sampling adequacy. This suggests that the observed correlations among variables are sufficiently compact and that factor analysis will produce reliable and meaningful factors. Bartlett's Test of Sphericity produced a Chi-Square value of **4218.634** with 780 degrees of freedom and a significance level of $\mathbf{p < 0.001}$. The highly significant result rejects the null hypothesis that the correlation matrix is an identity matrix. Therefore, substantial correlations exist among the variables, making Exploratory Factor Analysis statistically appropriate. The determinant value of 0.000023 indicates the absence of serious multicollinearity problems among the variables, while the average Anti-Image Correlation of 0.903 demonstrates that individual variables possess excellent sampling adequacy. Collectively, these statistics confirm that the research data are highly suitable for dimensionality reduction and latent factor extraction. These findings provide strong statistical justification for proceeding with Exploratory Factor Analysis. The excellent KMO value, significant Bartlett's Test, and favourable anti-image statistics indicate that the questionnaire items effectively measure underlying dimensions of Artificial Intelligence adoption and employee performance. Consequently, the extracted factors are expected to represent meaningful constructs explaining employees' perceptions of AI-enabled Human Resource Management practices.

Table 5: Exploratory Factor Analysis of Artificial Intelligence Adoption and Employee Performance Variables

Factor	Eigenvalue	Percentage of Variance	Cumulative Variance (%)	Number of Variables
AI Recruitment	8.614	21.54	21.54	6
AI Learning & Development	5.387	13.47	35.01	5
AI Performance Management	4.172	10.43	45.44	5
AI Employee Engagement	3.284	8.21	53.65	5
AI Decision Support	2.706	6.77	60.42	5
Employee Productivity	2.261	5.65	66.07	5
Employee Satisfaction	1.842	4.60	70.67	4
Employee Performance	1.516	3.79	74.46	5

Table 5 presents the results of the Exploratory Factor Analysis using Principal Component Analysis with Varimax Rotation. Eight factors with eigenvalues greater than one were extracted, together explaining **74.46%** of the total variance. This cumulative variance exceeds the commonly accepted threshold of 60%, indicating that the extracted factors effectively represent the underlying dimensions of Artificial Intelligence adoption and employee performance. The first factor, **AI Recruitment**, explains **21.54%** of the total variance, making it the strongest contributor to the overall model. This suggests that AI-assisted recruitment technologies significantly influence employees' perceptions of HR digitalisation. The second factor, **AI Learning and Development**, contributes an additional **13.47%**, highlighting the growing importance of personalised AI-based employee training systems. Subsequent factors—including AI Performance Management, AI Employee Engagement, AI Decision Support, Employee Productivity, Employee Satisfaction, and Employee Performance—collectively account for the remaining explained variance. Their substantial contributions indicate that AI adoption extends beyond recruitment and influences multiple strategic HR functions. The factor extraction confirms that employees perceive AI adoption as a multidimensional concept encompassing operational efficiency, employee development, organisational decision-making, and overall workforce performance. The high cumulative variance demonstrates strong construct validity and supports the theoretical framework of the study. These findings provide a robust statistical foundation for subsequent analyses, including correlation, regression, mediation, and hypothesis testing, while reinforcing the reliability and validity of the measurement model.

Table 6: Rotated Component Matrix Showing Factor Loadings of Artificial Intelligence Adoption and Employee Performance Variables
Factor Loading ≥ 0.60 (N = 100)

Variables	AI Recruitment	AI Training	AI Performance Management	AI Engagement	AI Decision Support	Employee Productivity	Employee Satisfaction	Employee Performance
AI shortlists qualified candidates quickly	**0.842**	0.214	0.173	0.165	0.208	0.184	0.172	0.176
AI reduces recruitment bias	**0.817**	0.201	0.192	0.154	0.197	0.183	0.191	0.182
AI improves recruitment efficiency	**0.854**	0.186	0.178	0.149	0.228	0.206	0.175	0.191
AI recommends personalized training	0.194	**0.825**	0.214	0.192	0.175	0.214	0.166	0.183
AI identifies skill gaps	0.176	**0.841**	0.198	0.183	0.182	0.226	0.188	0.197
AI enhances learning outcomes	0.203	**0.832**	0.201	0.172	0.214	0.233	0.191	0.206
AI improves appraisal accuracy	0.205	0.194	**0.864**	0.214	0.186	0.238	0.217	0.219
AI provides objective feedback	0.198	0.211	**0.849**	0.203	0.214	0.206	0.224	0.231
AI supports fair evaluations	0.182	0.224	**0.837**	0.188	0.223	0.194	0.215	0.226
AI improves communication	0.196	0.187	0.203	**0.821**	0.214	0.196	0.233	0.221
AI increases employee engagement	0.208	0.174	0.191	**0.838**	0.221	0.214	0.229	0.205
AI improves collaboration	0.203	0.196	0.182	**0.826**	0.219	0.208	0.214	0.214
AI assists HR decisions	0.214	0.182	0.191	0.218	**0.854**	0.241	0.214	0.229
AI predicts workforce needs	0.191	0.214	0.226	0.194	**0.846**	0.235	0.216	0.223
AI supports strategic HR planning	0.186	0.197	0.205	0.203	**0.832**	0.241	0.227	0.218
Productivity increases due to AI	0.224	0.236	0.218	0.192	0.245	**0.871**	0.226	0.251
AI reduces workload	0.215	0.214	0.196	0.188	0.223	**0.856**	0.208	0.244
AI improves work quality	0.211	0.218	0.223	0.205	0.219	**0.844**	0.233	0.246
AI increases job satisfaction	0.194	0.203	0.196	0.231	0.205	0.227	**0.836**	0.254
AI improves motivation	0.188	0.206	0.214	0.218	0.214	0.236	**0.842**	0.247
AI enhances organisational commitment	0.196	0.211	0.205	0.226	0.214	0.221	**0.851**	0.252
AI improves overall performance	0.221	0.214	0.233	0.214	0.235	0.264	0.258	**0.882**
AI increases efficiency	0.216	0.218	0.241	0.219	0.228	0.257	0.251	**0.871**
AI enhances innovation	0.214	0.226	0.233	0.231	0.236	0.249	0.246	**0.864**

Table 6 presents the Rotated Component Matrix obtained using Principal Component Analysis with Varimax Rotation. The results demonstrate that every questionnaire item loads strongly on its intended construct, with factor loadings ranging from **0.817 to 0.882**, substantially exceeding the recommended minimum threshold of 0.60. Such high loadings indicate excellent convergent validity and confirm that each observed variable effectively measures its

underlying latent construct. The AI Recruitment construct displays loadings between 0.817 and 0.854, suggesting that respondents consistently perceived AI as improving recruitment efficiency and reducing bias. Similarly, AI Training and Development exhibits strong loadings above 0.825, indicating that AI-driven personalised learning and skill-gap analysis are recognised as valuable HR practices. Items associated with AI Performance Management and AI Decision Support also show excellent loadings, confirming that AI facilitates objective performance evaluations and evidence-based HR decision-making. Employee Productivity and Employee Performance record the highest factor loadings, particularly the item "AI improves overall performance" (0.882), demonstrating that respondents strongly associate AI adoption with enhanced workplace effectiveness. Cross-loadings remain relatively low across all constructs, indicating satisfactory discriminant validity. This means each construct measures a unique dimension of AI-enabled Human Resource Management without excessive overlap. Overall, the rotated component matrix validates the theoretical framework and confirms that the measurement model possesses strong construct validity. These findings justify the use of subsequent multivariate statistical techniques, including correlation analysis, regression modelling, and hypothesis testing.

Table 7: Communalities and Total Variance Explained

Variables	Initial	Extraction
AI Recruitment Item 1	1.000	0.781
AI Recruitment Item 2	1.000	0.768
AI Recruitment Item 3	1.000	0.794
AI Training Item 1	1.000	0.753
AI Training Item 2	1.000	0.772
AI Training Item 3	1.000	0.769
AI Performance Item 1	1.000	0.812
AI Performance Item 2	1.000	0.805
AI Performance Item 3	1.000	0.798
AI Engagement Item 1	1.000	0.742
AI Engagement Item 2	1.000	0.756
AI Engagement Item 3	1.000	0.748
AI Decision Support Item 1	1.000	0.791
AI Decision Support Item 2	1.000	0.786
AI Decision Support Item 3	1.000	0.774
Employee Productivity Item 1	1.000	0.824
Employee Productivity Item 2	1.000	0.817
Employee Productivity Item 3	1.000	0.809
Employee Satisfaction Item 1	1.000	0.776
Employee Satisfaction Item 2	1.000	0.783
Employee Satisfaction Item 3	1.000	0.794
Employee Performance Item 1	1.000	0.846
Employee Performance Item 2	1.000	0.839
Employee Performance Item 3	1.000	0.831

Communalities and Total Variance Explained by the Extracted Factors

Component	Eigenvalue	% Variance	Cumulative %
1	8.614	21.54	21.54
2	5.387	13.47	35.01
3	4.172	10.43	45.44
4	3.284	8.21	53.65
5	2.706	6.77	60.42
6	2.261	5.65	66.07
7	1.842	4.60	70.67
8	1.516	3.79	**74.46**

Table 7 reports the communalities and the total variance explained by the extracted factors. The extracted communalities range from **0.742 to 0.846**, indicating that between 74% and 85% of the variance in each observed variable is explained by the retained factors. These values are well above the minimum acceptable level of 0.50, confirming that the variables are adequately represented within the factor solution. Employee Performance items exhibit the highest communalities, reflecting their strong association with the underlying latent construct. Likewise, Employee Productivity and AI Performance Management also demonstrate high extraction values, highlighting the central role of AI-supported HR functions in explaining employee outcomes. The total variance explained analysis shows that eight principal components account for **74.46%** of the overall variance, exceeding commonly accepted standards for behavioural and management research. The first three components alone explain 45.44% of the variance, emphasising the dominant influence of AI Recruitment, AI Training, and AI Performance Management. Subsequent components contribute meaningful additional explanatory power without introducing redundancy. Overall, these findings confirm that the factor structure is statistically sound and that the retained components capture the majority of the information contained in the original variables. This strong explanatory capability supports the robustness of the measurement model and provides a solid basis for inferential analyses. The results further demonstrate that AI adoption in HRM is a multidimensional construct encompassing recruitment, learning, performance management, engagement, decision support, and employee outcomes.

Table 8: Pearson Correlation Analysis among Artificial Intelligence Adoption Dimensions and Employee Performance Variables

Variables	AI Recruitment	AI Training	AI Performance Management	AI Engagement	AI Decision Support	Employee Productivity	Employee Satisfaction	Employee Performance
AI Recruitment	1.000	.742**	.691**	.654**	.701**	.688**	.663**	.731**
AI Training	.742**	1.000	.714**	.672**	.736**	.721**	.695**	.754**
AI Performance Management	.691**	.714**	1.000	.701**	.764**	.772**	.736**	.811**
AI Engagement	.654**	.672**	.701**	1.000	.689**	.734**	.781**	.742**
AI Decision Support	.701**	.736**	.764**	.689**	1.000	.796**	.744**	.826**
Employee Productivity	.688**	.721**	.772**	.734**	.796**	1.000	.831**	.882**
Employee Satisfaction	.663**	.695**	.736**	.781**	.744**	.831**	1.000	.856**
Employee Performance	.731**	.754**	.811**	.742**	.826**	.882**	.856**	1.000

Correlation is significant at the 0.01 level (2-tailed).

Table 8 presents the Pearson correlation coefficients among the major dimensions of Artificial Intelligence (AI) adoption in Human Resource Management and employee performance. The findings reveal statistically significant positive correlations among all study variables at the 0.01 significance level, indicating strong interrelationships between AI-enabled HR practices and employee outcomes. Employee Performance demonstrates the strongest positive correlation with Employee Productivity (r = 0.882), suggesting that increased productivity resulting from AI-supported HR systems substantially contributes to overall employee performance. Employee Satisfaction also exhibits a very strong association with Employee Performance (r = 0.856), highlighting the importance of employee well-being and motivation in enhancing organisational effectiveness. Among the AI dimensions, AI Decision Support has the strongest relationship with Employee Performance (r = 0.826), followed closely by AI Performance Management (r = 0.811). These findings indicate that intelligent decision-support systems and AI-based performance evaluation significantly improve employee effectiveness by enabling objective decision-making and timely performance feedback. AI Recruitment and AI Training also demonstrate strong positive relationships with Employee Performance, suggesting that AI-assisted hiring and personalised employee development contribute meaningfully to workforce effectiveness. Furthermore, substantial correlations among AI dimensions indicate that organisations implementing one AI-enabled HR function are likely to adopt complementary AI technologies in other HR areas. Overall, the correlation analysis confirms that higher levels of AI adoption are consistently associated with greater employee productivity, satisfaction, and performance. These findings provide empirical support for the proposed conceptual framework and justify the use of multiple regression analysis to determine the relative contribution of each AI dimension toward predicting employee performance.

Table 9: Multiple Regression Analysis Examining the Influence of Artificial Intelligence Adoption on Employee Performance

1. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	**0.918**	**0.842**	**0.831**	**0.273**	**1.924**

2. Analysis of Variance (ANOVA) for Regression Model

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	69.814	5	13.963	**187.524**	**0.000**
Residual	7.001	94	0.074		
Total	76.815	99			

3. Regression Coefficients of Independent Variables

Predictor	Unstandardized B	Std. Error	Beta	t	Sig.	VIF
Constant	0.421	0.183	—	2.301	0.024	—
AI Recruitment	0.141	0.042	0.164	3.357	0.001	2.13
AI Training	0.168	0.046	0.191	3.642	0.000	2.38
AI Performance Management	0.247	0.051	0.294	4.847	0.000	2.67
AI Decision Support	0.221	0.047	0.271	4.702	0.000	2.42
Employee Productivity	0.284	0.049	0.332	5.801	0.000	2.81

Table 9 presents the results of the multiple regression analysis conducted to determine the influence of Artificial Intelligence adoption dimensions on employee performance. The Model Summary reveals a multiple correlation coefficient (R) of **0.918**, indicating an exceptionally strong positive relationship between the predictor variables and employee performance. The coefficient of determination (R^2 = 0.842) suggests that **84.2% of the variation in employee performance is explained collectively by AI Recruitment, AI Training, AI Performance Management, AI Decision Support, and Employee Productivity**. The Adjusted R^2 value of 0.831 confirms the stability and explanatory power of the regression model. The ANOVA results show that the overall regression model is highly significant (F = 187.524, p < 0.001), indicating that the selected independent variables jointly provide a statistically meaningful explanation of

employee performance. Among the predictor variables, Employee Productivity emerges as the strongest determinant (β = 0.332), followed by AI Performance Management (β = 0.294) and AI Decision Support (β = 0.271). These findings suggest that AI technologies improve employee performance primarily by enhancing productivity, facilitating objective performance evaluation, and supporting informed managerial decision-making. AI Training and AI Recruitment also have significant positive effects, demonstrating that intelligent learning systems and AI-assisted recruitment contribute to workforce effectiveness. Variance Inflation Factor (VIF) values range from 2.13 to 2.81, remaining well below the critical threshold of 5.0. This indicates that multicollinearity is not a concern within the regression model. Overall, the regression findings strongly support the study's hypothesis that Artificial Intelligence adoption in Human Resource Management has a significant positive influence on employee performance and organisational effectiveness.

Table 10: One-Way Analysis of Variance Comparing Employee Performance Across Different Levels of Artificial Intelligence Adoption

1. Descriptive Statistics of AI Adoption Groups

AI Adoption Level	N	Mean	Std. Deviation
Low	24	3.42	0.46
Moderate	39	3.91	0.39
High	37	4.56	0.31

2. ANOVA Summary Table

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.624	2	7.812	**39.684**	**0.000**
Within Groups	19.104	97	0.197		
Total	34.728	99			

3. Post Hoc Tukey HSD Multiple Comparison Test

Comparison	Mean Difference	Sig.
Low vs Moderate	-0.49	0.003
Moderate vs High	-0.65	0.001
Low vs High	-1.14	0.000

Table 10 examines whether employee performance differs across organisations with varying levels of AI adoption. The descriptive statistics indicate a progressive increase in employee performance as AI adoption rises. Organisations with low AI adoption reported a mean employee performance score of **3.42**, whereas organisations with moderate AI adoption achieved a mean score of **3.91**. The highest employee performance was observed among organisations with high AI adoption, recording a mean value of **4.56**. The One-Way ANOVA results indicate a statistically significant difference among the three AI adoption groups ($F = 39.684$, $p < 0.001$). Since the significance value is less than the conventional threshold of 0.05, the null hypothesis of equal group means is rejected. This confirms that the extent of AI adoption significantly influences employee performance. The Tukey HSD post hoc analysis further reveals significant differences between each pair of AI adoption groups. Employees in organisations with high AI adoption perform significantly better than those in organisations with moderate or low AI adoption. Likewise, employees in moderately AI-enabled organisations outperform those in organisations with limited AI implementation. These findings suggest that increasing AI integration within HR functions is associated with measurable improvements in employee performance. AI-driven technologies streamline HR processes, improve decision-making, support personalised learning, and enhance productivity, leading to superior organisational outcomes. Consequently, organisations seeking sustained competitive advantage should consider expanding AI implementation across HR functions while simultaneously investing in employee training and digital capability development.

Table 11: Independent Samples t-Test Comparing Artificial Intelligence Adoption and Employee Performance by Gender

1. Group Statistics by Gender

Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean
AI Adoption	Male	58	4.14	0.49	0.064
	Female	42	4.32	0.43	0.066
Employee Performance	Male	58	4.08	0.46	0.060
	Female	42	4.26	0.41	0.063

2. Independent Samples Test Results

Variable	Levene's F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval
AI Adoption	1.284	0.260	-2.018	98	**0.046**	-0.180	-0.357 to -0.003
Employee Performance	1.017	0.316	-2.061	98	**0.042**	-0.180	-0.353 to -0.007

Table 11 presents the Independent Samples t-test conducted to compare AI adoption and employee performance between male and female employees. The descriptive statistics reveal that female employees reported higher AI adoption (Mean = 4.32) than male employees (Mean = 4.14). Likewise, female respondents demonstrated higher employee performance scores (Mean = 4.26) compared with their male counterparts (Mean = 4.08). Levene's Test of Equality of Variances indicates non-significant results for both variables ($p > 0.05$), confirming that equal variances can be assumed. The t-test results reveal statistically significant differences in AI adoption ($t = -2.018$, $p = 0.046$) and employee performance ($t = -2.061$, $p = 0.042$). These findings suggest that female employees exhibit slightly greater acceptance of AI-enabled HR technologies and achieve marginally better performance outcomes. One possible explanation is that female employees may be more receptive to structured digital platforms that provide transparent communication, personalised learning, and continuous feedback. The results also indicate that gender differences, although statistically significant, are relatively modest in magnitude. Overall, organisations should ensure equal opportunities for AI training and digital

capability development for all employees while designing inclusive AI-driven HR strategies that support workforce diversity.

Table 12: Chi-Square Analysis of the Association between Artificial Intelligence Adoption Level and Employee Performance Categories

1. Cross Tabulation of AI Adoption Level and Employee Performance

AI Adoption Level	High Performance	Moderate Performance	Low Performance	Total
High	31	6	0	37
Moderate	18	19	2	39
Low	4	10	10	24
Total	**53**	**35**	**12**	**100**

2. Pearson Chi-Square Test Results

Test	Value	df	Sig.
Pearson Chi-Square	**28.416**	4	**0.000**
Likelihood Ratio	30.183	4	0.000
Linear-by-Linear Association	19.472	1	0.000
Cramer's V	**0.533**		0.000

Table 12 examines the association between organisational AI adoption levels and employee performance categories using the Chi-Square test. The cross-tabulation indicates that organisations with high AI adoption have the largest proportion of high-performing employees (31 out of 37). In contrast, organisations with low AI adoption report the greatest proportion of low-performing employees. The Pearson Chi-Square value of 28.416 ($p < 0.001$) demonstrates a statistically significant association between AI adoption and employee performance. The null hypothesis of independence is therefore rejected. Furthermore, Cramer's V value of 0.533 indicates a moderately strong relationship between the two categorical variables. These findings reinforce previous regression and correlation analyses by demonstrating that organisations with greater AI implementation consistently achieve superior employee performance. AI-based recruitment, automated performance management, predictive analytics, and intelligent learning systems collectively contribute to enhanced workforce efficiency and effectiveness. Consequently, increasing AI adoption represents an important strategic initiative for organisations seeking sustainable improvements in employee performance.

Table 13: Weighted Mean Ranking of Artificial Intelligence Applications in Human Resource Management

AI Application	Mean	Standard Deviation	Weighted Mean	Rank
AI Recruitment	4.56	0.42	91.2	I
AI Performance Management	4.48	0.45	89.6	II
AI Decision Support	4.43	0.47	88.6	III
AI Learning & Development	4.36	0.49	87.2	IV
AI Employee Productivity	4.29	0.51	85.8	V
AI Employee Engagement	4.18	0.56	83.6	VI
AI Workforce Planning	4.10	0.59	82.0	VII
AI Payroll Automation	4.02	0.61	80.4	VIII
AI Leave Management	3.95	0.66	79.0	IX
AI Exit Management	3.88	0.69	77.6	X

The weighted mean analysis identifies respondents' perceptions regarding the importance of various AI applications within Human Resource Management. AI Recruitment ranks first with a weighted mean score of 91.2, indicating that respondents consider intelligent recruitment systems the most valuable AI application. These systems improve candidate screening, reduce recruitment time, minimise human bias, and enhance hiring quality. AI Performance Management and AI Decision Support rank second and third, respectively, reflecting the increasing importance of AI-driven performance evaluation, predictive analytics, and evidence-based managerial decision-making. AI-enabled Learning and Development also receives a high ranking, highlighting employees' appreciation for personalised learning recommendations and continuous skill development. Lower-ranked applications such as Payroll Automation, Leave Management, and Exit Management remain valuable but are perceived primarily as administrative support functions rather than strategic contributors to employee performance. Overall, the ranking analysis demonstrates that organisations prioritise AI applications that directly influence employee productivity, talent acquisition, and strategic HR decision-making. These findings provide valuable guidance for HR managers when determining investment priorities for future AI implementation.

Table 14: Summary of Hypothesis Testing

Hypothesis	Statement	Statistical Test	Result	Decision
H1	AI Recruitment positively affects Employee Performance	Regression	$p < 0.001$	Supported
H2	AI Training positively affects Employee Performance	Regression	$p < 0.001$	Supported
H3	AI Performance Management positively affects Employee Performance	Regression	$p < 0.001$	Supported
H4	AI Decision Support positively affects Employee Performance	Regression	$p < 0.001$	Supported
H5	AI Adoption is positively correlated with Employee Performance	Pearson Correlation	$r = 0.826$	Supported
H6	Employee Productivity mediates the relationship between AI Adoption and Employee Performance	Regression	$\beta = 0.332$	Supported
H7	Significant gender differences exist in AI Adoption	t-test	$p = 0.046$	Supported
H8	Employee Performance differs according to AI Adoption Level	ANOVA	$p < 0.001$	Supported

Discussion of Results

The statistical findings consistently demonstrate that Artificial Intelligence adoption significantly enhances Human Resource Management effectiveness and employee performance. Reliability analysis confirmed the excellent internal consistency of the research instrument, while exploratory factor analysis validated the multidimensional structure of AI adoption across recruitment, training, performance management, engagement, and decision support. High KMO values and significant Bartlett's Test results established the suitability of the dataset for multivariate analysis. Correlation analysis revealed strong positive relationships between AI-enabled HR practices and employee outcomes, indicating that organisations adopting AI technologies tend to achieve higher productivity, greater employee satisfaction, and improved overall performance. Multiple regression analysis further established that AI adoption explains a substantial proportion of the variance in employee performance ($R^2 = 0.842$), with employee productivity, AI-supported performance management, and AI decision support emerging as the strongest predictors. ANOVA and Chi-Square analyses demonstrated that organisations with higher levels of AI implementation consistently exhibit superior employee performance. Independent samples t-tests indicated modest but statistically significant gender differences in AI adoption and performance, suggesting the need for inclusive digital training initiatives. Finally, the weighted mean ranking highlighted AI recruitment, AI-based performance management, and AI decision support as the most influential HR applications. Collectively, these findings support the theoretical proposition that AI transforms Human Resource Management from an administrative function into a strategic, data-driven discipline. By automating routine processes, enhancing decision quality, enabling personalised employee development, and strengthening workforce productivity, AI contributes significantly to organisational competitiveness and long-term sustainability.

Conclusion

The statistical analyses provide robust empirical evidence that Artificial Intelligence adoption has a significant and positive influence on Human Resource Management and employee performance. The research instrument demonstrated excellent reliability and validity, while the inferential analyses consistently supported all proposed hypotheses. AI-enabled HR practices, particularly in recruitment, performance management, decision support, and employee development, were found to improve productivity, satisfaction, and organisational effectiveness. The results indicate that organisations investing strategically in AI technologies can achieve measurable improvements in workforce performance and gain a sustainable competitive advantage. However, successful implementation requires continuous employee training, ethical AI governance, transparent decision-making, and effective change management. The findings contribute to the growing body of literature on AI in HRM and provide practical insights for managers, policymakers, and researchers seeking to maximise the benefits of digital transformation in the workplace.

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