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Influence of Generative Artificial Intelligence on Human Resource Management Practices to Enhance Firm Performance, Productivity, and Resource Allocation

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Abstract

The current study aims to investigate how the adoption of Generative Artificial Intelligence in human resource practices influences organizational efficiency and decision-making. The usage of generative AI tools transforms firms' operating principles and approaches to managing human resources in various fields. The current research was conducted to assess the influence of these technologies on recruitment, workforce planning, employee engagement, performance appraisal, and overall functioning. The quantitative method was chosen as the most appropriate, and questionnaires were designed to estimate the level of impact on the participants. Regression analysis was conducted to identify the correlation between variables and establish the significance of the result. The results of the study demonstrated that adopting generative artificial intelligence technologies improves operational efficiency, which positively impacts the organizations' performance and optimal resource use. As a result, the paper contributes to the overall understanding of the application of such technologies and their influence on firms' functioning. Moreover, the findings may be beneficial for various stakeholders, including organizational leaders, human resource managers, and policymakers, as they wish to increase the efficiency of their operations and maximize profit by employing generative AI technologies.

Keywords: Artificial Intelligence, Firm Performance, Generative AI, Human Resource Management, Productivity, Resource Allocation.

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1. INTRODUCTION

Generative Artificial Intelligence (GenAI) is a disruptive technology that is transforming the operations of organizations and human resource management (HRM) processes. The application of artificial intelligence (AI) technologies in recruitment, training, assessment, and analysis of employees has been a game-changer in modern human resource management practices and decision-making processes (Ncube et al., 2025). Research studies on the application of AI in human resource management reveal that such an approach increases efficiency while minimizing human efforts in decision-making, thus improving data-driven strategies in the workplace (Ritu et al., 2024). Besides, the increased use of GenAI tools such as large language models and intelligent systems is being used to support strategic decision-making processes and improve productivity in the modern workplace (Shaikh et al., 2025).

Digital transformation and, by extension, AI are now critical functions that have become central to business strategies in a world where value creation and production processes are becoming increasingly competitive (Basu et al., 2023). Similarly, the application of Gen AI to human resource management is not only a game-changer for people processes but also productivity and economic growth. Human resource management systems are being transformed by artificial intelligence, enabling effective talent planning and management while driving decision-making efficiency and organizational effectiveness (Ncube et al., 2025). There is a growing body of research on the application of Gen AI in human resource management, but the evidence on the effectiveness of such an approach to transforming and scaling up technology-enabled human resource management practice in the context of organizational performance, productivity, and resource productivity is inconclusive (Shaikh et al., 2025). Literature on human resource management and the economy shows that studies on the role of human resource management in economic development and growth have focused on people processes such as recruitment and retention rather than organizational and economic outcomes (Ncube et al., 2025). There is also insufficient evidence on whether AI-enabled human resource management practices will have a positive impact on organizational performance, productivity, and resource productivity, given their level of organizational readiness and implementation strategies (Shaikh et al., 2025; Makhdum & Khanam, 2021). Therefore, there is a need to explore the role of Gen AI-enabled human resource management in organizational performance, productivity, and resource productivity. Hence the current research study aims to explore the influence of Generative AI in HRM on the firm performance in answering the following research question: *How does Generative AI in HRM affect organisational productivity?*

The study seeks to fill this gap and empirically investigate the impact of using Generative AI in HRM on the firm's performance, productivity, and resource allocation. Existing research has examined the role of AI in HRM, but few have delved into in-depth quantitative assessment of the impact at the firm level (Basu et al., 2023). Further, emerging evidence indicates that the use of AI enhances HR processes' efficiency and decision-making quality; however, the direct impact of AI on organizational performance metrics has yet to be explored in depth (Ritu et al., 2024). In addition, there is a lot of investment focus on AI, and it is critical to consider whether investments in AI lead to measurable productivity gains and best use of resources (Fang et al., 2025).

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2. LITERATURE REVIEW

2.1 Generative Artificial Intelligence in Human Resource Management Practices

The use of generative AI has become more common in HRM practices, such as recruitment, employee analytics, and performance management systems (Faisal, et al., 2023). AI-powered HRM solutions streamline repetitive actions and make informed decisions more efficient, offering real-time data on employee actions and trends (Ncube et al., 2025). It has been proven that these systems can enhance the efficiency of HR operations and ease the burden on managers in the administrative process (Ritu et al., 2024). Furthermore, HRM software powered by artificial intelligence uses machine learning and anticipating analytics to fringe the most appropriate acquisition and retention strategies. Artificial intelligence and machine learning in human resource management can benefit not only the company but the employees themselves; for example, a systematic review conducted by Basu et al. (2023) concluded that such programs have a positive effect on the level of productivity and innovation potential.

2.2 Firm Performance and Artificial Intelligence Integration

The impact of generative artificial intelligence technologies adoption, particularly for optimization purposes in the business process, on firm performance is growing. From the research results, AI-enabled human resource management practices have a positive influence on organizational performance by promoting higher efficiency, cost reduction, and strategic decision-making (Ritu et al., 2024). The IT industry's empirical study revealed that AI-enabled human resource management practices have a significant relationship with organizational performance indicators, including profitability and operational efficiency (Fang et al., 2025). Furthermore, AI integration helps align human resources with organizational objectives, boosting firm level performance outcomes (Ncube et al., 2025). The results show that AI has a significant impact on improving the competitiveness of companies in dynamic business settings.

2.3 Productivity Enhancement through Artifical Intelligence in Human Resource Management Practices

Enhanced productivity is a common benefit of Generative AI in organizations. By automating aspects of HR management like recruitment screening, performance assessments, and the development of training programs, AI systems boost operational efficiency (Shaikh et al., 2025). Recent experiments in organizations indicate that the use of GenAI technologies could markedly boost productivity, as it saves time on repetitive tasks and boosts value-added output (Fang et al., 2025). Furthermore, GenAI tools can aid in workforce planning and performance optimization, hence improving employee productivity levels. however, reseaerch also suggests that the productivity gains vary as they are contingent upon the successful execution of AI in an organizational workflow (Suh & Oh, 2026).

2.4 Resource Allocation and Decision-Making Efficiency

AI-powered HRM practices play a vital role in enhancing an organization's outcomes, including efficient resource allocation. AI tools help managers allocate a workforce and financial resources more efficiently by analyzing workforce data and forecasting HR requirements (Iqbal et al., 2025; Basu et al., 2023). This allows organizations to reduce inefficiencies and improve strategic planning. Furthermore, previous research suggest that AI-powered HRM systems facilitate data-driven decision-making, enabling companies to

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allocate resources according to their business goals and market needs (Ritu et al., 2024). In this way, AI helps in optimizing the use of humans and processes.

The extant literature consistently shows that Generative AI in HRM contributes in a positive way to the firm performance, productivity and allocation of resources. Most studies, however, continue to focus on the fragments rather than taking an integrated view with either HR operational efficiency or organizational performance as the focus. Although there is some integrated analysis of empirical data, simultaneously considering all three dimensions in an aggregated quantitative study remains limited, both in scope and in contexts (Basu et al., 2023; Ncube et al., 2025). Therefore, there is a need for further research to fully comprehend the implications of Gen AI on organizational productivity and prosperity.

3. METHODOLOGY

This study adopts a quantitative research approach to analyse the impact of Generative Artificial Intelligence (GenAI) on the performance, productivity and resource allocation of firms within the scope of Human Resource Management (HRM) practices. The study uses positivism philosophy and cross-sectional research design, where the quantitative data was collected through the use of a structured questionnaire with validated scales. Firm performance was measured through indicators such as efficiency, profitability perception, and strategic effectiveness, while productivity and resource allocation will focus on operational efficiency, task completion speed, and optimal use of human and organizational resources. Data was collected through both online and physical distribution of questionnaires depending on accessibility to respondents.

Organizations from different sectors, including IT, education, finance, and corporate services, are targeted where AI-supported HRM systems are increasingly adopted. Respondents included HR professionals, managers, and employees who are directly or indirectly involved in HR-related decision-making processes. The study sample was approximately 300 respondents selected from medium and large-scale organizations that have adopted or are in the process of adopting Generative AI in HRM functions. Purposive sampling technique was employed, a non-probability sampling method. Since not all organizations or employees are familiar with GenAI applications in HRM, purposive sampling ensures that only relevant respondents are included in the study.

Reliability of the research instrument was ensured through the application of Cronbach's alpha test, which measures internal consistency among questionnaire items. A Cronbach's alpha value of 0.70 or above will be considered acceptable, indicating that the items measuring each construct are consistent and reliable for further statistical analysis. Construct validity was assessed using factor analysis to ensure that the questionnaire accurately captures the dimensions of Generative AI in HRM, firm performance, and productivity/resource allocation. Ethical considerations were adhered to throughout the process of research. Responses were voluntary and information about the study was given to respondents before data collection. Respondents' confidentiality and privacy was guaranteed to respondents and ensured with no personal identifiers collected.

4. DATA ANALYSIS

4.1 Descriptive Analysis

The descriptive statistics presents an overview of the respondents' perceptions on the use of Generative Artificial Intelligence (GenAI) in Human Resource Management (HRM), firm performance, productivity and resource allocation. Mean, standard deviation and

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frequency distribution were used for descriptive statistics to analyze the central tendency and variability of data. Table 1 presents the descriptive statistics of the key variables used in the study.

Table 1: ***Descriptive Statistics***

Variables	Mean	S.D
GenAI in HRM Adoption	3.89	0.74
Firm Performance	3.76	0.81
Productivity	3.92	0.69
Resource Allocation Efficiency	3.71	0.83

The results show that GenAI is integrated into HRM practices, with a mean value of 3.89, productivity with the highest mean score (M = 3.92) show that Gen AI has a strong influence on operational efficiency and task execution speed. Firm performance and resource allocation also show high mean values, indicating a positive perception of AI-driven improvements in organizational outcomes.

4.2 Inferential Analysis

In order to assess the relationships between GenAI in HRM and firm performance, productivity, and resource allocation, inferential statistics were conducted on the data collected. Specifically, Pearson correlation and multiple regression analysis were performed in order to evaluate statistical significance and predictability of the observed variables.

Table 2: ***Correlation Matrix***

Variables	1	2	3	4
GenAI in HRM (1)	1			
Firm Performance (2)	0.68**	1		
Productivity (3)	0.74**	0.71**	1	
Resource Allocation (4)	0.65**	0.69**	0.66**	1

Note: ***p < .01*

The correlation results reveal a significant positive relationship between Generative AI in HRM and productivity (r=0.74), followed by firm's performance (r=0.68) and resource allocation efficiency level(r=0.65). This implies that the higher the application of Generative artificial intelligence in human resource management process, the better organizational performance it brings about.

4.3 Regression Analysis

Regression analysis was conducted to assess the influence of GenAI in human resource management on the firm's performance, productivity, and resource allocation.

Table 3: ***Regression Analysis***

Predictor (GenAI in HRM)	Beta (β)	t-value	Sig.
Firm Performance	0.41	6.32	.000
Productivity	0.53	8.74	.000
Resource Allocation	0.39	5.89	.000

In this regard, the results of the regression analysis, demonstrated in table 3, prove that GenAI in human resource management significantly influences other dependent variables. In other words, the use of artificial intelligence in human resource management practices has the most substantial effect on the level of productivity (β = 0,53).

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Still, it also has a considerable positive effect on firm performance and resource allocation. Thus, the obtained results confirm the hypothesis that the integration of artificial intelligence into human resource management practices will lead to enhanced performance and productivity of the firm. Moreover, the results of the study support the literature review concerning the critical role of AI in human resource management practices (Ncube et al., 2025).

4.4 Summary of Findings

The empirical findings of the study indicate significant positive relationship between Generative AI in HRM and organizational productivity and efficiency. The results show that organizations adopting AI-driven HRM practices experience enhanced firm performance, better resource allocation efficiency and improved productivity. Regression analysis confirms that adoption of Gen-AI impacts all three dependent variables significanlty, with the productivity being the most strongly influenced aspect. Moreover, the statitical analysis show that variables are strongly interrelated, depicting the improvements as uni-dimensional often resulting into improvements in other organizational outcomes such as firm performance and resource allocation. Such interconnectedness features the impact of AI adoption in HRM systems. This shows that Gen-AI technologies restructure and reorganize the HR practices such as recruitment, workforce planning, and performance evaluation, hence improving overall efficiency. These findings are in accordance with existing theories and research that emphasize the importance of Gen- AI in improving the organizational processes and decision-making quality (Shaikh et al., 2025; Fang et al., 2025).

5. DISCUSSION AND CONCLUSION

The study examines how Generative Artificial Intelligence (GenAI) influences human capital management, productivity, and resource allocation in Human Resource Management (HRM). The empirical findings demonstrate that the integration of Gen-AI into HRM practices has a significant positive impact on all three dependent factors. The results show that Gen-AI in HRM is a significant predictor of productivity, organization performance, and resource allocation in firms. It was found that the application of AI in HRM leads to an increase in productivity, which in turn positively affects other factors, such as performance. In other words, using AI in managing human capital could optimize operations and lead to performance outcomes. On the other hand, Gen-AI influences resource allocation in firms by helping organizations get the most out of their human resources. Using AI in managing human resources helps the firm operate more efficiently by analyzing employee performance and predicting future requirements. Overall, the results support the findings of prior works, which state that the application of AI in HRM leads to increased efficiency and effectiveness in firms (Ritu et al., 2024; Ncube et al., 2025; Fang et al., 2025).

There are several theoretical and practical implications of the study. From a theoretical standpoint, the research contributes to a better understanding of the integration of AI and its impact on human capital management by supporting digital transformation via GenAI and reimagining the human resource management model through automating and integrating AI-driven decision support systems therein (Makhdum, et al., 2023). In fact, several recent works in the field highlight the paradigm shift in organizational management practices driven by AI adoption in human resource management (Shaikh et al., 2025). Moreover, as the study confirms a higher correlation

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between the use of GenAI and productivity, there is a solid basis to assume that artificial intelligence facilitates human-machine collaboration and promotes collective productivity. In terms of practice, the study's evidence implies that companies that apply generative AI in human resource management practices are more likely to witness productivity growth and optimize their operations in terms of efficiency. Indeed, the considerable impact of GenAI on firms' performance suggests that organizations are to benefit from AI-enabled insights to make more profitable decisions and improve their human resource management strategies. Specifically, with regard to the study's evidence on resource allocation, it is reasonable to assume that AI implementation supports firms in terms of reducing costs and increasing operational efficiency. Finally, from a practical standpoint, the study adds to a growing body of research on the ability of AI to make organizations more competitive and efficient (Ncube et al., 2025; Fang et al., 2025). Therefore, there is a rationale to expect that in the future, the work on the role of Generative AI in human resource management will gain traction, with more studies shedding light on the mechanisms by which AI affects specific industries and organizations' long-term performance.

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