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ENHANCING EMPLOYEE PRODUCTIVITY THROUGH TECHNOLOGY SYSTEM AI-BASED APPROACHES

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Abstract

This study's purpose is to address the research gap regarding the use of AI in enhancing Employee Productivity. The study focuses on the role of Technology System AI in Employee Productivity and performance evaluation. Quantitative approach, using SEM PLS with 99 respondents. The findings of this study are (1)there is a significant influence of Employee Skill on Employee Productivity, (2) there is a significant influence of Employee Skill on Human Resource Readiness, (3) there is a significant effect of Human Resource Readiness on Employee Productivity, (4) there is a not significant influence of Technology System on Employee Productivity, (5) there is a significant influence of Technology System on Human Resource Readiness and (6) the role of Human Resources Readiness in mediating the indirect influence of Employee Skill and Technology System on Employee Productivity at the structural level is relatively low. This study contributes to understanding how Technology System AI enhances employee productivity and provides recommendations for expanding the use of AI in employee engagement practices.

Keywords: Employee Productivity, Employee Skill, Technology System AI, Human Resource Readiness

Introduction

Employee productivity is very important in today's industry. To catch up with the ability of employees to progress in the industry, professional skills from human resources are needed. One of the supports for accelerating the adjustment of human resources skills to the demands of the world of work requires an intelligent Technology System. The integration of Artificial Intelligence (AI) has presented numerous opportunities for enhancing employee productivity (Felten et al., 2019; Malik et al., 2022; Manav & Seamans, 2018; Seamans & Raj, 2018). The advent of Industry 4.0 has brought about significant changes, emphasizing the need for organizations to adapt and optimize their Human Resource (HR) functions (Klumpp et al., 2019; Malik et al., 2022). As businesses strive to stay competitive, human resources (HR) capabilities have become increasingly critical in leveraging the benefits of AI in the digital era. Artificial intelligence (AI) was created to boost productivity, promote economic growth, and assist people with various tasks (Khatri et al., 2020), (Ding et al., 2023), (Tabit & Soulhi, 2022). In accepting these changes, the readiness of human resources is very important, so that when the skills are fulfilled and the Technology System is integrated then the Employee Productivity can be improved.

There are Some researchers studied Employee Productivity through Technology System AI-based approaches, such as Employee Skill and Employee Productivity ((van Zyl, 2022), (Jacob, 2018), (Dlamini et al., 2022), (Susilo, 2020). Employee Skill and Human Resource Readiness ((Adeosun & Adegbite, 2022), (Alqudah et al., 2022) (Zayed et al., 2022) , Human Resource Readiness on Employee Productivity ((Laseinde et al., 2020), (Andrew, 2017), Technology System on Employee Productivity (Murugesan et al., 2023), (Al-Kharabsheh et al., 2023), (Williams, 2019), Technology System on Human Resource Readiness (Waddill, 2020), (Sabrina Jahan, 2014), (Ben Moussa & El Arbi, 2020), (Nandhini et al., 2022), (Board et al., 2020)

This article explores the findings of a quantitative study that Employee Skill, Technology System application of AI, through Human Resource Readiness, and its impact on employee productivity. The study involved 99 employees in diverse companies. By examining five keys of AI applications in HR capability and three elements of HR readiness, this research sheds light on the contributions of AI in driving sustainable growth and enhancing workforce efficiency.

The Role of AI in HR Capability

The study identified five major areas where AI applications have the potential to revolutionize HR capabilities (Vaishya et al., 2020). The first area is *Precision Hiring*: AI-powered algorithms can analyze vast amounts of candidate data, enabling more accurate and efficient recruitment processes. By identifying patterns

and matching candidate profiles to job requirements, AI systems can streamline the hiring process, saving time and resources for HR teams. The second area is *training and Development*: AI-based platforms can personalize learning experiences for employees by analyzing their skills, competencies, and data performance. By delivering targeted training content and recommendations, AI systems help employees acquire new skills and improve their productivity.

The third area is *Performance Management*: AI technologies can provide real-time feedback and performance evaluations, enabling more objective and data-driven assessments. By automating performance management processes, organizations can ensure fair evaluations, identify areas for improvement, and foster a culture of continuous development. The next area is *Employee Engagement*: AI-powered chatbots and virtual assistants can enhance employee engagement by providing instant support for HR-related queries and concerns. These technologies can provide individualized support, enabling HR staff to concentrate on strategic goals and guaranteeing that employees receive up-to-date information. The last is *Workforce Analytics*: AI algorithms can analyze large datasets to derive insights and predictions about workforce trends, enabling HR teams to make informed decisions. By leveraging AI-driven analytics, organizations can optimize workforce planning, identify skill gaps, and align talent strategies with business objectives.

Artificial Intelligence and Employee Productivity

To effectively leverage AI technologies, HR departments must possess certain readiness elements: (1) Adaptability: HR professionals need to be open to change and willing to embrace new technologies and processes. An adaptable mindset allows HR teams to navigate the challenges and opportunities presented by AI integration effectively, (2) Skill Enhancement: The ability to work alongside AI systems requires HR professionals to enhance their digital and analytical skills. Upskilling and reskilling initiatives can equip HR teams with the knowledge and expertise necessary to leverage AI tools effectively, and (3) Organizational Support: Successful AI integration in HR relies on support from organizational leaders. Management must provide the necessary resources, infrastructure, and training to enable HR professionals to harness the full potential of AI technologies.

The Resource-Based Theory of the Firm provides a framework for understanding how organizations can use their resources to achieve a sustained competitive advantage. By investing in employee skill development, implementing effective technology systems, and optimizing human resource management practices, organizations can create a work environment that fosters employee engagement, leading to increased productivity and performance (Barney et al., 2021). This theory emphasizes the internal resources and capabilities of an organization as sources of competitive advantage. In the context of employee productivity, the theory suggests that organizations can leverage their resources, including employee skills, technology systems, and human resources, to enhance productivity and performance.

The Artificial intelligence (AI) can affect employee productivity in some aspects; organizational growth and capability, employee well-being and safety, productivity gains, and learning accelerating. First, (AI) has a relationship with organizational growth and HR capability. The study confirmed that HR capability plays a vital role in driving sustainable organizational growth. The five AI application areas in HR, namely precision hiring, training and development, performance management, employee engagement, and workforce analytics, were found to support adaptability and human resource capability. These applications empower HR professionals to make data-driven decisions, optimize processes, and create a more agile and productive workforce.

Second, (AI) can improve employee well-being and safety. The integration of AI in HR practices also offers substantial benefits in enhancing employee well-being and safety. By automating routine tasks and providing instant support through chatbots and virtual assistants, AI systems alleviate the burden on HR teams, allowing them to prioritize employee well-being initiatives. The study emphasized the importance of leveraging AI applications to create a safe and supportive work environment.

Third, (AI) can enhance Productivity Gains from AI Adoption. The most compelling findings from the study revolve around the significant productivity gains achieved through the adoption of AI-based approaches. The research encompassed three distinct case studies, each focusing on different user groups and domains. The results consistently demonstrated remarkable improvements in productivity, with more complex tasks yielding greater gains. In the first case study, customer service agents utilizing AI tools experienced a 13.8% increase in their ability to handle customer inquiries per hour. The second case study, involving business professionals writing routine documents, revealed a remarkable 59% increase in document production per hour with AI assistance. Lastly, programmers coding projects with AI support were able to complete 126% more projects per week. These findings highlight the transformative impact of AI on productivity across various job roles and industries.

Lastly, (AI) can accelerate learning. In addition to productivity gains, the quantitative study identified an interesting trend related to learning speed. In the customer support case study, agents who utilized AI tools achieved competence levels that typically took eight months in just two months. This accelerated learning highlights the potential of AI to expedite skill development and proficiency, benefiting both employees and

organizations. By leveraging AI-driven tools, employees can acquire essential competencies more rapidly, enabling them to contribute to the organization's goals effectively.

The previous relevant research that supports this study is elaborated in the following figure.

Table 1: Relevant Researches

Variables	Writer	Findings
Employee Skill and Employee Productivity	(van Zyl, 2022), (Jacob, 2018) (Dlamini et al., 2022), (Susilo, 2020)	Employee Skills have a significant effect on employee performance
Employee Skill and Human Resource Readiness	(Adeosun & Adegbite, 2022) (Alqudah et al., 2022) (Zayed et al., 2022)	High-performance HRM Practices are positively related to readiness for change.
Human Resource Readiness on Employee Productivity	(Laseinde et al., 2020), (Andrew, 2017)	Employee Readiness for organizational change was positively and significantly correlated to the dependent variable (employee performance).
Technology System on Employee Productivity	(Murugesan et al., 2023), (Al-Kharabsheh et al., 2023), (Williams, 2019)	Technology System AI in HRM gives numerous benefits to the HR department and employees Technology System Significant to Employee Productivity
Technology System on Human Resource Readiness	(Waddill, 2020) (Sabrina Jahan, 2014), (Ben Moussa & El Arbi, 2020),	Technology and Has Impact on Human Resources and Business Professionals

Employee Skill and Employee Productivity

The findings of the study conducted by (van Zyl, 2022), (Jacob, 2018), (Dlamini et al., 2022), (Susilo, 2020) indicate that spatial and industrial dynamics have a positive influence on worker productivity levels. The findings indicate that spatial and industrial dynamics have a positive influence on worker productivity levels. Employee performance and productivity were impacted by the interaction between managers and staff. The effectiveness of an employee is significantly influenced by their talents. Employee performance and productivity were impacted by the interaction between managers and staff. The effectiveness of an employee is significantly influenced by their talents.

Hypothesis 1: Employee Skill has a positive effect on Employee Productivity

Employee Skill and Human Resource Readiness

The study conducted by (Adeosun & Adegbite, 2022) revealed that A p-value greater than 0.05 suggests that the majority of HR professionals are not normally prepared for future employment in Nigeria. Meanwhile, the study conducted by (Alqudah et al., 2022) (and Zayed et al., 2022) revealed that High-performance HRM Practices are positively related to readiness for change. Human resource skill significant adjustment predicted the dynamic capability of hospitality businesses.

Hypothesis 2: Employee Skill has a positive effect on Human Resource Readiness

Human Resource Readiness on Employee Productivity

The result of the study of (Laseinde et al., 2020), (Andrew, 2017) stated that employee productivity and TQM procedures in a technologically advanced industry. The dependent variable (employee performance) and employee readiness for organizational change were positively and strongly associated.

Hypothesis 3: Human Resource Readiness has a positive effect on Employee Productivity

Technology System on Employee Productivity

The study conducted by (Murugesan et al., 2023), (Al-Kharabsheh et al., 2023), (and Williams, 2019) revealed that the System of Technology AI in HRM offers the HR division and employees many advantages. AI utilization and corporate productivity have a positive and significant relationship. Employee productivity is significantly impacted by technology systems.

Hypothesis 4: Technology System has a positive effect on Employee Productivity

Technology System on Human Resource Readiness

Based on the study conducted by (Waddill, 2020) Human resource and business professionals are impacted by technology. It will support management in making wiser decisions. Individual and line manager communications accelerated. HR departments grew more effective as self-service HR services replaced paper-based transactions (Sabrina Jahan, 2014). The influence of HRIS on the individual innovation behavior of HR professionals is noteworthy and favorable. Technology plays a vital role in the increase in productivity, which consequently increases profitability, in the industrial sector with an export focus. Lastly, E-learning Learner satisfaction is positively and significantly impacted by Actual Use

Hypothesis 5: Technology System has a positive effect on Human Resource Readiness

Hypothesis 6: Human Resource Readiness mediates the effects on Employee Skills and Employee Productivity
Hypothesis 7: Human Resource Readiness mediates the effect of the Technology System on the Employee Productivity

Research Method

The data for the study were collected through a questionnaire. The questionnaire included items related to Employee Skills, Technology Systems, Human Resource Readiness, and Employee Productivity. The participants, who were employees from various organizations, were asked to respond to the questionnaire distributed by indicating their level of agreement or providing specific ratings on the given items.

Finding and Discussion

The result of the research is elaborated as follows:

Table. 2 The Result of Analysis SEM PLS

Variable	Path coefficients	coefficients			
		p-value	bottom	up	f square
Employee Skill -> Employee Productivity	0.363	0.000	0.165	0.546	0.206
Employee Skill -> Human Resource Readiness	0.495	0.000	0.326	0.665	0.384
Human Resource Readiness -> Employee Productivity	0.400	0.000	0.218	0.588	0.209
Technology System -> Employee Productivity	0.099	0.438	-0.149	0.348	0.011
Technology System -> Human Resource Readiness	0.364	0.002	0.140	0.592	0.133

Based on the table above, it can be stated the direct effect of each variable. *First*, Hypothesis 1 (H1) is accepted, that there is a significant influence of Employee Skill on Employee Productivity with path coefficient (0.363) and p-value (0.000 < 0.05). Any changes to Employee Skills will increase Employee Productivity. In the 95% confidence level, the influence of Employee Skill in increasing Employee Productivity lies between 0.165 to 0.546. However, the existence of Employee Skill in increasing Employee Productivity has a moderate influence on the structural level (f square = 206). The Employee Skill improvement program must be considered very important where when there is an increase in Employee Skill it will increase Employee Productivity up to 0.546. The result supports the research conducted by (Setyanti et al., 2022). It shows that factors including job happiness, work ethic, and employee skills have a favorable and significant impact on employee work productivity.

Second, Hypothesis 2 (H2) is accepted, there is a significant influence of Employee Skill on Human Resource Readiness with a path coefficient (0.495) and p-value (0.000 <0.05). Every change in Employee Skills has a significant effect on Human Resource Readiness. In the 95% confidence level, the influence of Employee Skills in improving Human Resource Readiness lies between 0.326 to 0.665. However, the existence of Employee Skills in improving Human Resource Readiness has a moderate influence on the structural level (f square = 384). The Employee skill improvement program must be considered very important where when there is an increase in Employee Skill it will increase Human Resource Readiness up to 0.665. The result supports the research conducted by (Vrchota et al., 2020).

The *third*, Hypothesis 3 (H3) is accepted that there is a significant effect of Human Resource Readiness on Employee Productivity with path coefficient (0.400) and p-value (0.000 <0.05). Every change in Human Resource Readiness has a significant impact on Employee Productivity. In the 95% confidence level, the influence of Human Resource Readiness in increasing Employee Productivity lies between 0.218 to 0.588. However, the existence of Human Resource Readiness in increasing Employee Productivity has a moderate influence on the structural level (f square = 209). The need for a Human Resource Readiness improvement program is considered very important where when there is an increase in Human Resource Readiness increases employee Productivity up to 0.588.

Fourth, Hypothesis 4 (H4) is rejected as there is a significant influence of Technology Systems on Employee Productivity with a path coefficient (0.099) and p-value (0.438 > 0.05). Any changes to the Technology System have no significant effect on Employee Productivity. In the 95% confidence level, the influence of Technology Systems in increasing Employee Productivity lies between -0.149 to 0.348. However, the existence of the Technology System in increasing Employee Productivity has a small/moderate influence

at the structural level (f square = 11). The Technology System improvement program is considered not important where when there is an increase in the Technology System increases Employee Productivity up to 0.348.

Fifth, Hypothesis 5 (H5) is accepted, there is a significant influence of the Technology System on Human Resource Readiness with a path coefficient (0.364) and p-value (0.002 < 0.05). Every change in the Technology System has a significant effect on Human Resource Readiness. In the 95% confidence level, the influence of the Technology System in improving Human Resource Readiness lies between 0.140 to 0.592. However, the existence of the Technology System in increasing Employee Productivity has a small/moderate influence at the structural level (f square = 113). The Technology System improvement program is considered quite important where when there is an increase in the Technology System increases Human Resource Readiness to 0.592.

Table. 3 Result of Statistic Upsilon (v)

No	Effect	Statistic Upsilon (v)	Description
1	Employee Skill --> Human Resource Readiness--> Employee Productivity	(0,495)2 x (0,364)2= 0,032	Low Effect
2	Technology System --> Human Resource Readiness--> Employee Productivity	(0,363)2 x (0,364)2 = 0,017	Low Effect

Based on the table above it can be elaborated the research finding indirect effect on hypotheses 6 and 7. The interpretation of the statistical value on the mediation effect (v) refers to those recommended by Ogbeibu et al. (2020), scale of 0.175 (high mediation effect), 0.075 (medium mediation effect), and 0.01 (low mediation effect). Based on the calculation above, the role of human resources readiness in mediating the indirect influence of Employee Skill / Technology Systems on Employee Productivity at the structural level is relatively low.

Table. 4 Result of R-square

Variable	R-square	R-square adjusted
Employee Productivity	0,591	0,335
Human Resource Readiness	0,593	0,337

The statistical size of the R square describes the magnitude of variation in endogenous variables that can be explained by other exogenous variables in the model. According to Chin (1998) the qualitative value of R square interpretation is 0.19 (low influence), 0.33 (moderate influence), and 0.66 (high influence). Based on the results of the processing above, it can be said that the amount of influence of Employee Skill and Human Resource Readiness on Employee Productivity is 59.1% (close to high influence). The magnitude of the influence of Technology Systems and moderation of Human Resource Readiness on Employee Productivity is 59.3% (moderate influence).

Conclusions

The findings of the quantitative study underscore the transformative potential of AI-based approaches in enhancing employee productivity. With applications ranging from precision hiring to performance management and workforce analytics, AI technologies empower HR professionals to make data-driven decisions and optimize processes. The research findings emphasize the importance of HR readiness in effectively integrating AI tools and highlight the significant productivity gains achieved through AI adoption.

As organizations navigate the digital landscape, AI catalyzes growth, efficiency, and inclusivity. By fostering human-computer symbiosis, organizations can harness the unique strengths of both human and AI systems, resulting in enhanced productivity and improved work quality. As the workplace continues to evolve, AI-based approaches will play a pivotal role in shaping the future of work and driving sustainable organizational success.

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