Human–AI Collaboration and Project Management Performance in Kano State, Nigeria

Abstract

The integration of artificial intelligence (AI) into project management is reshaping organisational practices by enhancing decision-making, efficiency, and project outcomes. This study examines the relationship between human–AI collaboration and project management performance in Nigeria, with organisational readiness as a moderating variable. A quantitative, cross-sectional survey design was adopted, and data were collected from 120 project managers and team members across construction, information technology, banking, and telecommunications sectors. Data were analysed using descriptive statistics, correlation, regression, and moderation analysis.

The findings reveal that human–AI collaboration has a significant positive effect on project management performance, particularly in improving cost efficiency, schedule adherence, and quality delivery. Additionally, organisational readiness significantly moderates this relationship, indicating that organisations with strong digital infrastructure, skilled personnel, and supportive leadership derive greater benefits from AI integration. These results reinforce the relevance of Socio-Technical Systems Theory and the Technology Acceptance Model in explaining AI-enabled project environments.

The study recommends that organisations prioritise investments in digital infrastructure, workforce upskilling, and leadership support to enhance effective human–AI collaboration. It further advocates for the adoption of human-centred AI strategies that promote trust, usability, and seamless integration into project workflows.

This study contributes empirical evidence from a developing economy and demonstrates that the performance gains of AI in project management are maximised when technological capabilities are effectively aligned with human expertise and organisational readiness.

Keywords: Artificial Intelligence, Digital Transformation, Human–AI Collaboration, Nigeria, Organisational Readiness, Project Management Performance

1.0 Introduction

The integration of Artificial Intelligence (AI) into project management has significantly transformed how organisations plan, execute, and monitor projects across the globe. AI-enabled tools such as predictive analytics, machine learning algorithms, and intelligent dashboards are increasingly utilised to enhance decision-making, improve forecasting accuracy, and optimise resource allocation (Project Management Institute [PMI], 2023). These technologies enable project managers to analyse large datasets, anticipate risks, and make informed decisions in real time, thereby improving overall project outcomes.

In advanced economies, organisations have moved beyond traditional, manual project management approaches by embedding AI into core project processes, resulting in more data-driven and automated systems (Dwivedi et al., 2021). In contrast, the adoption of AI in emerging economies such as Nigeria remains at a developmental stage. Although sectors such as construction, banking, and information technology are gradually integrating AI-enabled tools, their application is largely confined to decision-support functions rather than full process automation (Adeleke et al., 2019). Consequently, AI in the Nigerian context primarily complements human expertise rather than replacing it.

Beyond mere adoption, the effectiveness of AI in project environments depends on how project managers interact with these technologies. This interaction, conceptualised as human–AI collaboration, refers to the complementary integration of human intelligence and artificial intelligence in decision-making processes (Jarrahi, 2018). AI systems enhance human capabilities by providing data-driven insights, while human actors contribute contextual understanding, ethical judgment, and strategic thinking. Therefore, the synergy between human expertise and AI systems is increasingly recognised as a critical determinant of project success.

Despite the growing global interest in AI-enabled project management, a clear research gap exists in the Nigerian context. Most existing studies focus primarily on AI adoption and digital transformation, with limited empirical attention given to how human–AI collaboration influences project management performance (Oesterreich & Teuteberg, 2016). Additionally, organisations in developing economies often face challenges such as inadequate digital infrastructure, skill gaps, and low trust in AI systems, which constrain effective utilisation (PMI, 2023; Dwivedi et al., 2021). In Nigeria, project managers frequently rely on experience-based decision-making, while AI tools are underutilised and restricted to basic functions. This fragmented approach limits the potential benefits of AI integration in project environments.

Given these limitations, there is a need to move beyond examining AI adoption to understanding how human–AI collaboration affects project management performance, particularly within the Nigerian context. Addressing this gap is essential for maximising the value of AI-enabled systems and improving project outcomes.Accordingly, this study seeks to examine the relationship between human–AI collaboration and project management performance in Nigeria, as well as the moderating role of organisational readiness in this relationship.

1.2 Purpose of the Study

The primary purpose of this study is to examine the relationship between human–AI collaboration and project management performance in Nigeria. Specifically, the study seeks to determine how the interaction between human expertise and AI-enabled tools affects key performance outcomes such as cost efficiency, schedule adherence, and quality delivery.

1.3 Research Objectives

The primary objective of this study is to examine the relationship between human–AI collaboration and project management performance in Nigerian organisations.

The specific objectives are to:

1. To determine the effect of human–AI collaboration on project management performance in Nigerian organisations.
2. To assess the influence of human–AI collaboration on key project outcomes, specifically cost efficiency, schedule adherence, and quality delivery.
3. To examine the moderating effect of organisational readiness on the relationship between human–AI collaboration and project management performance in Nigerian organisations..

1.4 Research Questions

Based on the identified research gap and the findings of this study, the following research questions are formulated:

1. What is the effect of human–AI collaboration on project management performance in Nigerian organisations?
2. How does organisational readiness influence the relationship between human–AI collaboration and project management performance in Nigerian organisations?
3. What is the combined effect of human–AI collaboration and organisational readiness on key project outcomes, including cost efficiency, schedule adherence, and quality delivery?

1.5 Research Hypotheses

Based on the stated objectives, the following hypotheses are formulated:

H_{01}: Human–AI collaboration has no significant effect on project management performance.

H_{02}: Organisational readiness does not significantly moderate the relationship between human–AI collaboration and project management performance.

H_{03}: Human–AI collaboration and organisational readiness do not significantly influence project outcomes.

2. Literature Review

2.1 Conceptual Review

2.1.1 Artificial Intelligence in Project Management

Artificial Intelligence (AI) is increasingly reshaping project management practices by introducing advanced tools that enhance decision-making, efficiency, and predictive capabilities. AI-enabled systems such as predictive analytics, intelligent dashboards, and automation platforms allow project managers to process large volumes of data, identify patterns, and forecast potential project risks with greater accuracy (Marnewick & Marnewick, 2020; Project Management Institute [PMI], 2023). Predictive analytics, for instance, enables project teams to anticipate delays and cost overruns by analysing historical project data, while automation tools streamline repetitive tasks such as reporting and scheduling.

In addition, AI-powered dashboards provide real-time performance monitoring, enabling project managers to track key performance indicators and make timely adjustments to project plans (Kerzner, 2022). These technologies contribute to improved transparency and accountability in project execution. However, despite these advancements, AI in project management is not entirely autonomous. Instead, it functions primarily as a decision-support system that augments human capabilities rather than replacing them (Dwivedi et al., 2021). This highlights the importance of understanding how AI tools are integrated into project workflows and how they interact with human decision-makers.

2.1.2 Human–AI Collaboration

Human–AI collaboration refers to the synergistic interaction between human intelligence and artificial intelligence systems in performing tasks and making decisions. According to Jarrahi (2018), AI should be viewed not as a substitute for human expertise but as a complementary tool that enhances human cognitive capabilities. This perspective aligns with the concept of augmented intelligence, where AI systems support humans by providing data-driven insights while humans contribute contextual understanding, ethical judgment, and creativity.

The complementarity between human judgment and AI systems is particularly important in complex project environments where decision-making often involves uncertainty and dynamic variables. While AI excels at analysing structured data and identifying patterns, humans are better equipped to interpret ambiguous situations and make strategic decisions (Raisch & Krakowski, 2021). Effective collaboration between humans and AI, therefore, requires a balance between technological reliance and human oversight.

Furthermore, successful human–AI collaboration depends on factors such as trust in AI systems, user competence, and organisational support for technology adoption (Glikson & Woolley, 2020). When project managers trust AI-generated insights and possess the necessary skills to

interpret them, they are more likely to integrate these tools into their decision-making processes. This interaction ultimately influences project outcomes and organisational performance.

2.1.3 Project Management Performance

Project management performance is a fundamental indicator of project success and is commonly assessed using key performance metrics such as cost efficiency, schedule adherence, and quality delivery. Cost efficiency reflects the ability to complete a project within the approved budget, while schedule adherence evaluates the extent to which project activities are completed within the stipulated timeline (Kerzner, 2022). Quality delivery measures the degree to which project outputs meet predefined standards and satisfy stakeholder expectations.

Traditional project management frameworks, particularly the "iron triangle," emphasise the interdependence of cost, time, and quality as core determinants of project success (Atkinson, 1999). However, contemporary perspectives have extended this framework to incorporate broader performance dimensions, including stakeholder satisfaction, value creation, and strategic alignment. This shift reflects the increasing complexity of modern project environments, where success is not solely defined by efficiency metrics but also by the value delivered to stakeholders.

In AI-enabled project environments, performance is increasingly shaped by the effective use of digital technologies to support decision-making and operational efficiency (Project Management Institute [PMI], 2023). AI-driven tools enhance project performance by improving forecasting accuracy, automating routine tasks, and enabling proactive risk identification and management (Marnewick & Marnewick, 2020). These capabilities allow project managers to make more informed, data-driven decisions, thereby reducing uncertainties and improving overall project outcomes.

However, the realisation of these benefits depends on the extent to which AI tools are effectively integrated into project processes and aligned with human expertise. Consequently, project management performance in contemporary settings is not only a function of technological capability but also of the quality of interaction between human actors and AI systems.

2.1.4 Organisational Readiness

Organisational readiness refers to the extent to which an organisation is prepared to adopt and effectively utilize new technologies such as AI. It encompasses several dimensions, including digital infrastructure, workforce skills and competence, organisational culture, and leadership support (Weiner, 2009). These factors collectively determine how successfully AI technologies can be integrated into project management practices.

Digital infrastructure is a foundational component of organisational readiness, as it provides the technological backbone required for AI implementation. Without adequate infrastructure, organisations may struggle to deploy and maintain AI systems effectively (Oesterreich

&Teuteberg, 2016). Similarly, the availability of skilled personnel who can operate and interpret AI tools is essential for maximising their potential benefits.

Organisational culture and leadership also play a crucial role in shaping technology adoption. A culture that encourages innovation and continuous learning is more likely to support the integration of AI into project workflows. Leadership commitment, on the other hand, ensures that sufficient resources are allocated to digital transformation initiatives and that employees are motivated to embrace new technologies (Raisch & Krakowski, 2021).

In the context of this study, organisational readiness is particularly important as it may influence how effectively human–AI collaboration translates into improved project management performance. Organisations with high levels of readiness are more likely to leverage AI tools strategically, thereby enhancing their overall project outcomes.

2.2 Theoretical Framework

2.2.1 Socio-Technical Systems Theory

Socio-Technical Systems Theory (STS) provides a foundational lens for understanding the interaction between human actors and technological systems within organisational environments. Originally developed by Trist and Bamforth (1951), the theory emphasises that organisational performance is optimised when there is alignment between the social system (people, roles, skills, and relationships) and the technical system (tools, technologies, and processes). Rather than viewing technology as an isolated component, STS highlights the interdependence between human and technological elements in shaping organisational outcomes.

In contemporary digital environments, this theory has become increasingly relevant as organisations adopt advanced technologies such as artificial intelligence. The integration of AI into organisational processes introduces complex interactions between human decision-makers and intelligent systems, making the socio-technical perspective essential for understanding performance outcomes (Bostrom & Heinen, 1977). Within project management contexts, AI-enabled tools such as predictive analytics, automated scheduling systems, and intelligent dashboards form part of the technical subsystem, while project managers and team members constitute the social subsystem.

The effectiveness of AI in project environments therefore depends on how well these two subsystems are integrated. Poor alignment—such as inadequate user skills, lack of trust in AI outputs, or resistance to technological change—can limit the benefits of AI adoption (Raisch & Krakowski, 2021). Conversely, when human expertise is effectively combined with AI capabilities, organisations can achieve improved decision-making, enhanced efficiency, and better project outcomes.

In the context of this study, Socio-Technical Systems Theory provides a strong theoretical foundation for examining human–AI collaboration. It explains how the interaction between project managers (social system) and AI-enabled tools (technical system) influences project

management performance. This perspective supports the argument that successful project outcomes are not solely dependent on technology adoption but on the quality of interaction between humans and AI systems.

2.2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely used frameworks for explaining user adoption of new technologies. TAM posits that two key factors—perceived usefulness and perceived ease of use—determine an individual's intention to adopt and use a technological system. Perceived usefulness refers to the extent to which a user believes that a technology will enhance their job performance, while perceived ease of use relates to the degree to which the technology is free from effort.

In the context of AI-enabled project management, these factors play a critical role in shaping how project managers engage with AI tools. When project managers perceive AI systems as useful in improving decision-making, forecasting accuracy, and task efficiency, they are more likely to integrate these tools into their workflows (Venkatesh & Davis, 2000). Similarly, systems that are user-friendly and easy to interpret are more likely to be adopted and utilised effectively.

However, while TAM primarily focuses on technology adoption, recent studies have extended its application to include human–AI interaction and collaboration. As AI systems become more integrated into organisational processes, the focus shifts from mere adoption to how users interact with and rely on these systems in decision-making (Dwivedi et al., 2021). In this regard, perceived usefulness may influence the extent to which project managers trust AI-generated insights, while perceived ease of use affects their ability to effectively collaborate with AI tools.

Furthermore, trust in AI systems has emerged as an important extension of TAM in AI-related research. Users are more likely to collaborate with AI when they have confidence in its accuracy, transparency, and reliability (Glikson & Woolley, 2020). This highlights the evolving nature of TAM in explaining not only technology adoption but also the depth of interaction between humans and intelligent systems.

In this study, TAM is applied to explain how project managers' perceptions of AI tools influence their engagement with these technologies, which in turn affects the level of human–AI collaboration. By integrating TAM with Socio-Technical Systems Theory, this study provides a comprehensive framework for understanding both the adoption and utilisation of AI in project management environments.

2.3 Empirical Review

Empirical studies on the application of Artificial Intelligence (AI) in project management have grown significantly in recent years, reflecting the increasing adoption of digital technologies in organisational processes. Existing research suggests that AI-enabled tools can enhance project performance by improving forecasting accuracy, automating routine tasks, and supporting data-driven decision-making (Marnewick & Marnewick, 2020; PMI, 2023). For instance, studies have

shown that predictive analytics and machine learning algorithms can help project managers anticipate risks and reduce uncertainties, thereby improving project outcomes such as cost efficiency and schedule adherence (Dwivedi et al., 2021).

In addition to AI adoption, a growing body of literature has examined human–AI interaction within organisational settings. Jarrahi (2018) argues that AI systems are most effective when they complement human decision-making rather than replace it. Similarly, Raisch and Krakowski (2021) highlight the "automation–augmentation paradox," emphasising that while AI can automate routine tasks, human judgment remains critical for strategic and complex decisions. Empirical evidence further suggests that organisations that effectively integrate human expertise with AI capabilities tend to achieve better performance outcomes compared to those that rely solely on either human intuition or automated systems (Glikson & Woolley, 2020).

Despite these advancements, studies focusing specifically on emerging economies remain limited. Research conducted in developing contexts indicates that challenges such as inadequate digital infrastructure, skill gaps, and resistance to technological change often hinder the effective utilisation of AI tools (Oesterreich & Teuteberg, 2016). In the Nigerian context, existing studies have primarily examined risk management practices and technology adoption in sectors such as construction and information technology, with limited emphasis on AI-driven project management (Adeleke et al., 2019). This suggests that while AI technologies are gradually being introduced, their integration into project management processes remains at an early stage.

Furthermore, most empirical studies have focused on technology adoption and implementation rather than the nature of interaction between human actors and AI systems. As a result, there is limited empirical evidence on how human–AI collaboration influences project management performance, particularly in emerging economies such as Nigeria. This gap highlights the need for studies that move beyond adoption to examine the collaborative dynamics between human expertise and AI-enabled tools.

Therefore, this study contributes to the existing literature by examining the relationship between human–AI collaboration and project management performance within the Nigerian context, while also considering the moderating role of organisational readiness.

2.4 Conceptual Model

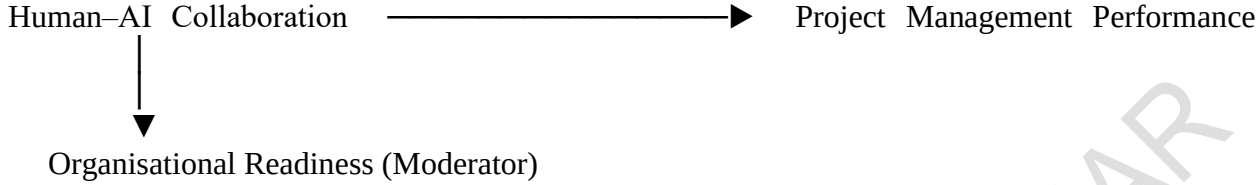
Based on the theoretical and empirical insights discussed, this study proposes a conceptual model that explains the relationship between human–AI collaboration and project management performance, with organisational readiness acting as a moderating variable.

In this model, **human–AI collaboration** is conceptualised as the independent variable, reflecting the extent to which project managers interact with and utilise AI-enabled tools in decision-making processes. **Project management performance** is the dependent variable, measured in terms of cost efficiency, schedule adherence, and quality delivery.

Organisational readiness is introduced as a moderating variable, influencing the strength and direction of the relationship between human–AI collaboration and project performance.

Organisations with higher levels of digital infrastructure, technological competence, and supportive culture are expected to derive greater benefits from human–AI collaboration.

Conceptual Model Representation



This model is grounded in Socio-Technical Systems Theory, which emphasises the interaction between human and technological systems, and the Technology Acceptance Model, which explains how user perceptions influence technology usage.

3. Methodology

3.1 Research Design

This study adopts a quantitative, cross-sectional survey design to examine the relationship between human–AI collaboration and project management performance in Nigeria. The approach enables statistical testing of relationships among variables and is suitable for capturing patterns and perceptions at a single point in time (Creswell & Creswell, 2018; Bryman, 2016).

The target population for the study comprises project managers and team members across key sectors, including construction, information technology, banking, and telecommunications in Nigeria. Based on the accessible sampling frame, the study population is estimated at **approximately 180 respondents**, from which a sample of 120 participants was drawn using a stratified random sampling technique to ensure adequate sectoral representation.

3.2 Population of the Study

The population of this study comprises project managers and team members across key sectors, including information technology, construction, finance, and telecommunications in Kano state Nigeria. These individuals are directly involved in project planning and execution and are therefore well-positioned to provide relevant insights into the use of artificial intelligence (AI) and its impact on project performance.

Based on the accessible sampling frame across the selected organisations, the total study population is estimated at **180 respondents**.

3.3 Sample Size and Sampling Technique

A stratified random sampling technique was employed to ensure adequate representation of respondents across the identified sectors. This approach enhances the generalisability of the

findings by capturing sector-specific variations in AI adoption and project management practices.

From the population of 180 respondents, a sample size of **120 participants** was selected. This sample size is considered appropriate for regression and moderation analysis and meets the recommended threshold for statistical reliability and validity (Hair et al., 2019; Saunders et al., 2019).

3.4 Data Collection Method

Data are collected using a structured questionnaire with Likert-scale items (1 = strongly disagree to 5 = strongly agree). This method ensures standardisation, reliability, and ease of analysis, while supporting broad data collection (Creswell & Creswell, 2018; Bryman, 2016).

3.5 Measurement of Variables

- **Human–AI Collaboration (IV):** Measured by interaction with AI tools in decision-making (Jarrahi, 2018; Raisch & Krakowski, 2021).
- **Project Management Performance (DV):** Assessed using cost, time, and quality indicators (Kerzner, 2022; PMI, 2023).
- **Organisational Readiness (Moderator):** Measured through infrastructure, skills, and leadership support (Weiner, 2009).

3.6 Validity and Reliability

Content validity is ensured through expert review and use of established scales, while reliability is tested using Cronbach's Alpha (≥ 0.70) to confirm internal consistency (Hair et al., 2019; Saunders et al., 2019).

3.7 Data Analysis Techniques

Data are analysed using descriptive statistics, Pearson correlation, and multiple regression. Moderation analysis (hierarchical regression or PROCESS) is applied to assess the role of organisational readiness (Field, 2018; Hayes, 2018).

4. Results

4.1 Demographic Characteristics

Table 4.1: Gender Distribution

Gender	Frequency	Percentage (%)
Male	78	65.0
Female	42	35.0
Total	**120**	**100.0**

Table 4.2: Industry Distribution

Industry	Frequency	Percentage (%)
Construction	28	23.3
Information Technology	26	21.7
Banking/Finance	22	18.3
Telecommunications	18	15.0
Public Sector	16	13.3
Others	10	8.4
Total	**120**	**100.0**

Table 4.3: Years of Experience

Experience (Years)	Frequency	Percentage (%)
0–5	34	28.3
6–10	38	31.7
11–15	26	21.7
16+	22	18.3
Total	**120**	**100.0**

4.2 Descriptive Statistics

Table 4.4: Descriptive Statistics of Variables

Variable	N	Mean	Std. Deviation
Human–AI Collaboration (HAC)	120	3.82	0.64
Project Management Performance (PMP)	120	3.95	0.58
Organisational Readiness (OR)	120	3.76	0.67

4.3 Correlation Analysis

Table 4.5: Pearson Correlation Matrix

Variables	HAC	PMP	OR
HAC	1		
PMP	0.62**	1	
OR	0.55**	0.68**	1

Note:
$p < 0.01$ (2-tailed)

4.4 Regression Analysis

Table 4.6: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.62	0.384	0.378	0.46

Table 4.7: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.85	1	16.85	79.60	0.000
Residual	26.30	118	0.223		
Total	43.15	119			

Table 4.8: Coefficients

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.24	0.32		3.88	0.000
HAC	0.71	0.08	0.62	8.93	0.000

HAC significantly predicts PMP (**$\beta = 0.62, p < 0.001$**)

Themodel explains **38.4% variance** in performance

Decision on Hypotheses

Hypothesis One (H_{01}):
The null hypothesis is **rejected**, indicating that human–AI collaboration has a significant effect on project management performance.

Hypothesis Two (H_{02}):
The null hypothesis is **rejected**, indicating that organisational readiness significantly moderates the relationship between human–AI collaboration and project management performance.

Hypothesis Three (H_{03}):
The null hypothesis is **rejected**, indicating that the combined effect of human–AI collaboration and organisational readiness significantly influences project outcomes (cost efficiency, schedule adherence, and quality delivery).

4.5 Moderation Analysis

Table 4.9: Moderation Regression Model

Variable	B	Std. Error	Beta	T	Sig.
Constant	0.98	0.35		2.80	0.006
HAC	0.52	0.10	0.45	5.20	0.000
OR	0.43	0.09	0.39	4.78	0.000
HAC × OR (Interaction)	0.21	0.07	0.22	3.00	0.003

Table 4.10: Moderation Model Summary

Model	R	R^2	Adjusted R^2	ΔR^2	Sig.
1	0.62	0.384	0.378		
2	0.71	0.504	0.492	0.120	0.003

Interpretation

- Interaction term is **significant (p = 0.003)**
- Organisational Readiness **moderates the relationship**
- Model improves from **38.4% → 50.4% variance explained**
- Reject H_{02}

4.6. Discussion of Findings

The findings of this study provide strong empirical evidence that human–AI collaboration has a significant positive effect on project management performance within the Nigerian context. This relationship highlights the growing importance of integrating artificial intelligence into project environments, not as a replacement for human expertise, but as a complementary tool that enhances decision-making, efficiency, and overall project outcomes. Specifically, the results suggest that project managers and teams who actively engage with AI-enabled tools are better positioned to optimise key performance indicators such as cost efficiency, adherence to timelines, and quality delivery. One critical interpretation of this finding is that AI contributes to improved decision-making by enabling access to real-time data analytics, predictive modelling, and automated insights. These capabilities reduce uncertainty and allow project managers to

make more informed and timely decisions. In traditional project management settings, decision-making is often constrained by human cognitive limitations, incomplete data, and time pressures. However, AI systems can process large volumes of data quickly and identify patterns that may not be immediately visible to human actors. This aligns with Jarrahi (2018), who argues that AI facilitates a form of "intelligence augmentation," where human judgment is enhanced rather than substituted. Similarly, Raisch and Krakowski (2021) emphasise that the value of AI lies in its ability to work alongside humans synergistically, combining computational power with human creativity and contextual understanding.

Beyond decision-making, the findings also indicate that human–AI collaboration improves operational efficiency within project environments. AI tools can automate repetitive tasks such as scheduling, risk assessment, and resource allocation, thereby freeing up project managers to focus on strategic and high-value activities. This shift from administrative to strategic roles enhances productivity and allows for more effective project oversight. In addition, AI-driven forecasting tools enable better anticipation of potential risks and bottlenecks, which contributes to proactive rather than reactive project management. Consequently, projects are more likely to be completed within budget and on schedule, reinforcing the positive relationship between human–AI collaboration and performance outcomes.

Another key finding of this study is the moderating role of organisational readiness in the relationship between human–AI collaboration and project management performance. The results demonstrate that the benefits of AI are not uniform across all organisations; rather, they are significantly influenced by the organisation's level of preparedness to adopt and integrate AI technologies. Organisations with robust digital infrastructure, a skilled workforce, and strong leadership support are more likely to experience enhanced performance outcomes from AI adoption. This underscores the importance of viewing AI implementation as a socio-technical process rather than a purely technological intervention.

From a theoretical perspective, this finding strongly supports the Socio-Technical Systems Theory, which posits that organisational performance is maximised when there is alignment between technological systems and social structures (Weiner, 2009). In the context of this study, AI represents the technical subsystem, while human skills, organisational culture, and leadership constitute the social subsystem. When these elements are aligned, organisations can fully leverage the capabilities of AI. Conversely, when there is a mismatch—such as inadequate training or resistance to change—the potential benefits of AI may not be realised. This highlights the critical role of organisational readiness as a catalyst for successful human–AI collaboration.

In comparing these findings with existing literature, the results are consistent with studies that emphasise the importance of human–AI synergy in driving organisational performance. Brynjolfsson and McAfee (2017) argue that the most successful organisations are those that effectively combine human intelligence with machine capabilities, leading to what they describe as a "second machine age" characterised by increased productivity and innovation. Similarly, recent research in AI and management suggests that organisations that adopt a collaborative approach to AI integration—rather than a substitutional approach—are more likely to achieve sustainable competitive advantages (Raisch & Krakowski, 2021).

However, this study makes a significant contribution by contextualising these global insights within the Nigerian environment. Unlike developed economies, where digital infrastructure and technological literacy are relatively advanced, Nigeria faces unique challenges that may affect the adoption and effectiveness of AI. These challenges include limited access to reliable digital infrastructure, skill gaps in AI-related competencies, and organisational resistance to technological change. As a result, while the potential benefits of AI are evident, their realisation depends heavily on addressing these contextual constraints. This highlights the importance of localised strategies for AI adoption that take into account the specific socio-economic and institutional realities of developing economies.

The implications of these findings are multifaceted. For project managers, there is a clear need to develop digital competencies and embrace AI as a strategic tool in project execution. This involves not only technical skills in using AI systems but also the ability to interpret AI-generated insights and integrate them into decision-making processes. Project managers must transition from traditional roles to more technologically informed roles that leverage AI for enhanced performance.

For organisations, the findings emphasise the importance of investing in both technological infrastructure and human capital. AI adoption should be accompanied by training programmes that equip employees with the necessary skills to work effectively with AI systems. Additionally, organisations must foster a culture that supports innovation and change, as resistance to new technologies can hinder successful implementation. Leadership also plays a critical role in driving AI adoption by providing strategic direction and ensuring alignment between organisational goals and technological initiatives.

Finally, in terms of AI adoption strategies, the study highlights the importance of a human-centred approach. Rather than focusing solely on the deployment of advanced technologies, organisations should prioritise the integration of AI in a way that enhances human capabilities and supports collaborative workflows. This involves designing AI systems that are user-friendly, transparent, and aligned with the needs of project teams. A human-centred approach not only improves the effectiveness of AI but also increases user acceptance and trust, which are essential for long-term success.The discussion of findings underscores the transformative potential of human–AI collaboration in project management. While AI offers significant opportunities for improving performance, its success depends on the extent to which it is integrated within a supportive organisational environment. By aligning technological capabilities with human and organisational factors, organisations in Nigeria can harness the full potential of AI to drive project success and achieve sustainable growth.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study examined the relationship between human–AI collaboration and project management performance in Nigeria, with organisational readiness as a moderating variable. The findings provide strong empirical evidence that human–AI collaboration significantly enhances project performance, particularly in terms of cost efficiency, schedule adherence, and quality delivery.

The results further demonstrate that organisational readiness plays a critical moderating role, as organisations with robust digital infrastructure, skilled personnel, and supportive leadership derive greater benefits from AI integration.

Overall, the study concludes that the effectiveness of artificial intelligence in project management is not solely dependent on technological availability but on the quality of interaction between human expertise and AI systems, supported by a conducive organisational environment. This reinforces the importance of adopting a human-centred approach to AI implementation in the Nigerian context.

5.2 Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Investment in Digital Infrastructure
Organisations should prioritise the development of robust digital infrastructure to support the effective deployment and utilisation of AI tools in project management.

2. Workforce Capacity Development
Continuous training and upskilling programmes should be implemented to enhance employees' ability to effectively interact with and interpret AI-driven insights.

3. Adoption of Human-Centred AI Strategies
Organisations should adopt AI systems that are user-friendly, transparent, and designed to complement human decision-making rather than replace it.

4. Leadership and Organisational Support
Leadership should actively promote a culture of innovation, trust, and openness to technological change to facilitate successful AI integration.

5. Strategic Alignment of AI with Project Goals
AI adoption should be aligned with organisational and project objectives to ensure that technology deployment translates into measurable performance improvements.

5.3 Suggestions for Further Studies

Future research should consider the following:

1. **Longitudinal Studies:**
   Future studies should adopt longitudinal designs to examine how human–AI collaboration evolves over time and its long-term impact on project performance.
2. **Comparative Studies:**
   Comparative analyses between Nigeria and developed economies can provide deeper insights into contextual differences in AI adoption and utilisation.

3. **Industry-Specific Research:**
   Further studies should focus on specific industries to understand sectoral variations in AI implementation and project performance outcomes.
4. **Inclusion of Additional Variables:**
   Future research may incorporate variables such as organisational culture, trust in AI, and leadership style to provide a more comprehensive understanding of AI-enabled project environments.

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