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Editorial Desk

I have the honour of introducing the inaugural issue of the *LASU Journal of Multidisciplinary Nigerian Studies (LASUJMNS)*, Volume 1, Number 1 (December 2025). This maiden publication represents a significant step in the commitment of Lagos State University to advancing rigorous, multidisciplinary scholarship focused on Nigerian realities.

LASUJMNS was established to provide a credible academic platform for high-quality research that interrogates the social, economic, political, educational, cultural, and technological frameworks in Nigeria. The journal responds to the growing need for scholarly work that moves beyond single-discipline approaches and offers integrated, evidence-based perspectives capable of informing policy, practice, and public discourse.

As a peer-reviewed, biannual, open-access journal, LASUJMNS is committed to academic excellence, ethical publishing, and accessibility. All submissions undergo a rigorous double-blind peer review process in line with international best practices and the principles of the Committee on Publication Ethics (COPE). Only original, methodologically sound, and relevant manuscripts are considered for publication.

The articles featured in this inaugural issue reflect the multidisciplinary scope and scholarly standards of the journal. They address contemporary Nigerian issues across key sectors, which offers insightful analyses, empirical findings, and practical implications that contribute meaningfully to national development discussions.

I sincerely appreciate the dedication of the Editorial and Advisory Boards, the professionalism of our reviewers, and the confidence of the authors who contributed to this first volume. Their collective efforts have laid a strong foundation for the journal. On behalf of the Editorial Board, I invite scholars, policymakers, and practitioners to engage with this issue and to partner with us in building a vibrant platform for multidisciplinary Nigerian studies.

Prof. M. O. B. Mohammed, FNAEAP

Editor-in-Chief

LASU Journal of Multidisciplinary Nigerian Studies (LASUJMNS)

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EXPLORING THE INFLUENCE OF TECHNOLOGICAL FACTORS ON ORGANISATIONAL OPERATIONAL EFFICIENCY IN SELECTED NIGERIAN IT ORGANISATIONS

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Abstract

Technology has emerged as the fulcrum that rocks the boat of business organisations, but what has not been fully explored is the intensity of its integration in the Nigerian business environment. This research investigates how technological factors bears influence on the efficiency of business operations of the IT industry in Nigeria, with key focus on firms such as Sidmach Technologies Nigeria Limited, Softcodes International, and NetPlusDotCom in the Southwest part of Nigeria. The study investigated how technological factors relate to the efficiency of business operations of the IT firms in Nigeria. The study took a quantitative approach, with a structured questionnaire administered among 125 professionals of the IT firms in question; and the results obtained was computed for research goals by Partial Least Squares' Structural Equation Modeling (PLS-SEM) via SPSS. The findings indicated that technological alignment has a key positive impact on improving the efficiency of business operations of the firms by 20% efficiency gains. Therefore, this study bridged the gap in research on technology in Nigerian different fields of influence and serves as key information for firms in the IT field directly related to improving efficiency by capitalising on technology-compatible infrastructure and staff for improved efficiency of business operations.

Keywords:

Artificial Intelligence (AI), Organisational operational efficiency, Technological Factors.

APA 7th Edition Citation:

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Introduction

Technology has reshaped the mechanisms, processes and competences of organisation, decision-making and competitive strategy in global trade. For the application of predictive analytics knowledge on Natural Language Processing, Machine learning and Predictive Analytics are applied to improve operational efficiency, create better customer experiences and innovate quality business processes. Brynjolfsson and McAfee (2023), predicted that AI automation when operationalised could raise productivity of adopting industries by as much as 40 percent, internal performance level against which to compete. The adoption of AI by companies across the globe has been widely known for achieving supply chain optimisation, personalised services and cost savings in developed economies like North America and Europe to shape the trends in technology advancement.

In contrast however, technological advancement in the developing world, which includes Sub-Saharan Africa, is still at a premature stage and held back by also structural, economic and institutional factors. As the largest economy on the African continent and a hotbed of technological advancements, Nigeria provides an interesting setting for studying technology-mediated work practices. With the ever-vibrant technology ecosystem in the country, as well as increasing IT organisations and multinational corporations invested therein, the indications are that Nigeria will head the wheel of Africa's digital transformation in years to come. Yet, Nigerian organisations are beset with considerable challenges: deficiencies in digital infrastructure, AI skill shortages, high costs of implementation, ambiguous regulations, and market volatility (Hassan, 2024; Oseni, 2024).

According to (Chen & Wu, 2024), the adoption of technological factors is what determines the pace at which technology advances. For instance, the feasibility of integrating technological systems depends on factors such as AI tool compatibility and integration complexity. New studies reveal that AI has the potential for improving the operational efficiency of an organisation, which can be seen through increases in operational efficiency, employee productivity, innovation, and customer satisfaction, among others, and improved financial outcomes (Aina, 2025).

This study investigated technological factors and its influence on organisational operational efficiency in selected Nigerian IT organisations. The selection of the organisations ensures a varied sample to better understand how such technological factors combine in the unique setting of Nigeria. Without the holistic understanding of these dynamics, organisations risk suboptimal technological integration, hence losing opportunities for efficiency, innovation, and competitiveness.

Technological factors shape the full adoption of AI which include AI tool complexity and incompatibility, limit integration feasibility. Past studies have investigated the impact of technological factors on organisational outcomes using other climes, sectors or industries (Lin & Qin, 2023; Aina, 2025); yet the extent to which technological factors specifically AI tool compatibility and complexity influence organisational operational efficiency in some selected IT organisation in the Nigerian clime has not fully been explored. Hence this study provides a targeted analysis of how this variable influence organisational operational efficiency in selected Nigerian IT organisations. Therefore, the main objective of this study is to investigate the influence of technological factors (AI tool compatibility and complexity) on organisational operational efficiency in selected Nigerian IT organisations.

Hypothesis

H₀: Technological factors (AI tool compatibility and complexity) have no significant influence on organisational operational efficiency in selected Nigerian IT organisations.

2.0 Literature Review

2.1 Conceptual Clarification

Concept of Technological Factors

The integration of artificial intelligence (AI) into Nigeria's IT industry depends heavily on technological factors that enable or constrain its adoption and impact on organisational operational efficiency. These factors include the compatibility of the AI tool, the complexity of the AI tool, the concept of interoperability, data infrastructure, the scalability of the implementation process, and infrastructural issues such as connectivity and processing capabilities. In the Nigeria IT industry, where growth is accompanied by infrastructural constraints, these factors are instrumental in determining the extent to which organisational actors are able to leverage the technological factors to improve operational efficiency, innovation, customer satisfaction, employee productivity, or financial performance. In this section, factors relating to AI tools and its compatibility will be extensively discussed buttressing it with current studies and their findings including works of Ese and Bello (2022) and that by Nwachukwu and Dada (2024), which critically discussed the adoption of AI in the Nigeria's IT industry.

AI Tool Compatibility

Compatibility of AI tools and technology refers to the ease of integrating AI technology into a ready-made information technology structure within an organisation, such as software applications, hardware systems, and databases (Chen & Wu, 2023). Adoptable AI tools make it easier and faster for organisations to seamlessly integrate them with already existing infrastructures in technology. Ese and Bello (2022) emphasised that compatibility between AI technology and existing information technology infrastructures in Nigeria makes it easier for the deployment of AI technology in the country's information technology organisations. It improves the acceptability and adoption of AI technology. Adoptable AI technology in data management enables organisations in Nigeria to adopt and implement AI technology without having to overhaul existing infrastructures.

AI Tool Complexity

Complexity of AI tools simply mean the extent to which individuals perceive the working and utilising of AI systems to be difficult especially in the area of technicalities, intensity and ability to be an expert. This portrays the extent to which high-level coding can be achieved and data processing which are part of the complex nature of AI tools, especially in the Nigerian IT industry due to the limitation of technical expertise and intensity. Aina (2025) concluded that complex AI systems resulted in the reduction of adoption among Nigerian ed-tech platforms by 15% due to the technical requirements faced by such platforms in limited intensity environments.

Organisational Operational Efficiency

Organisational operational efficiency entails the ability of an organisation to achieve processes with less waste and reduced outputs using resources. In the Nigerian IT sector, operational efficiency can be key for an organisation with plans to organise coding, testing, or processing

activities in an effective, resource-challenged environment. Hassan (2024) explained operational efficiency as the time and cost savings involved in the processes made possible by the use of tools such as machine learning within AI. According to Aina (2025), there was an improvement in operational efficiency by 20% due to the application of AI in the Nigerian IT sector. The efficiency within an organisation can be measured by parameters such as completion of processes in given times, usage rate of resources, and removal of errors.

Theoretical Justification

Technology Acceptance Model (TAM)

TAM was invented by Fred Davis in 1989. Several authors have applied TAM to the adoption of AI. These include Chen and Wu (2024); Adebayo and Musa (2024); Merhi and Harfouche (2023). TAM assumes technology adoption is determined by perceived usefulness, that is, the belief that AI improves job performance, and perceived ease of use. This is the belief that AI is simple to operate. These, in turn, will emanate from external factors such as competition or vendor support. Employees, therefore, adopt AI because they see it as useful and user-friendly. Therefore, TAM is appropriate for IT organisations within Nigeria at an individual level of adoption where workforce acceptance is important. Its focus is user-centric, explaining employee acceptance and, thus, important in organisations where workers drive the implementation of AI.

Empirical Findings

Oseni (2024) investigated the barriers to AI Adoption in Nigeria's IT Industry. The research analysed how environmental perceptions impact AI adoption and organisational operational efficiency in Nigeria's IT industry. The results of the research indicated that when AI systems are incompatible and based on obsolete technology, it leads to a negative impact on AI adoption of 30%. On the contrary, when AI systems are compatible, it results in a 20% increase in AI adoption, thereby increasing organisational operational efficiency by 15% and enhancing customer satisfaction of 10%.

Aina (2025) investigated the triangulation on the adoption of AI in the educational industry which are technologically based in Nigeria. The findings revealed a high impact of environmental factors on AI adoption mechanism and operational efficiency within the education technology domain in Nigeria. Mixed method of questionnaire was used to solicit responses from a three focused groups discussion and participants were 60 out of 80 investigated educational organisations which were technologically based amounting to 75% response rate. The findings showed that it was essential for AI systems to be compatible with existing IT infrastructure to reap the benefit of higher adoption rates by 20%, thus enhancing operational efficiency by 15% as well as customer satisfaction by 20%.

Methodology

This study investigated the impact of technology-related aspects on organisational operational efficiency that exists within selected IT companies in Lagos Nigeria, including Sidmach Technologies Nigeria Limited – a major player in the IT sector with expertise in education,

public sector, and enterprise solutions and known for its fully developed AI tools such as e-learning platforms; Softcodes International Limited – an organisation with specialisation and delivery in enterprise resource planning (ERP) software development and business process automation at an evolving level of AI tool use; and NetPlusDotCom Limited – an e-commerce and e-payment solutions delivery and digital transformation agency with payment processing and customer analytics supported by use of AI at an evolving level.

The study adopted research design with the population of the three IT firms being 90, 25 and 45 respectively (HR Units of the organisations) making a total of 155 consisting of all the employees in the respective organisations. The sample size was calculated using Taro Yamane formular to be 112 and was increased to 125 respondents to accommodate potential non-responses and ensure sufficient data and this was allocated proportionally across the three organisations based on their employee counts.

The study employed a structured questionnaire in a five-point Likert Scale format to elicit responses from the respondents. The questionnaire was divided into three sections A, B and C with each section capturing the demographics information of the respondents, the independent variable and the dependent variables respectively. Data was collected from the selected IT firms through electronic means (Google forms) from a total of 125 respondents including 73 from Sidmach Technologies, 20 from Softcodes International, and 32 from NetPlusDotCom respectively.

Content and construct validity was employed to ensure the validity of the instrument. This was effected through the use of experts in the industry and seasoned researchers, and the reliability was done through the use of using Cronbach's Alpha to ensure internal consistency with the result being 0.82, which is considered highly acceptable being more than 0.7 (Nunnally, 1978). Data was analysed using descriptive and statistical tools in SPSS software. The statistical tool included mean, median and standard deviation which were utilised in summarising the perception of respondents on technological factors on organisational efficiency. Hypothesis was tested with inferential statistics which included multiple regression to ascertain the influence of technological factors on organisational efficiency and the statistical significance was set at $p < 0.05$, ensuring robust validation of findings.

Results

Table 1: Descriptive Statistics of Research Constructs

Construct	Sub-Variable	Mean	Standard Deviation
Technological Factors	AI Tool	3.92	0.78
	Compatibility		
	AI Tool Complexity	3.15	0.92
Organisational Operational Efficiency		3.95	0.73

A high mean of 3.92 was recorded for compatibility with existing IT systems, indicating that respondents generally perceived AI tools to be rather compatible with existing IT systems; thus,

this enhances adoption. On the other hand, the mean value of complexity regarding AI tools was 3.15, suggesting that it is perceived as challenging to implement, especially among organisations with an under-resourced technical component; this corroborates findings by Aina (2025). Organisational operational efficiency ranged at a mean score of 3.95 to indicate positive AI-driven outcomes.

Table 2: Technological Factors – Sidmach Technologies Nigeria Limited

S/N	Description	Rating Scale					Total
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	
1	The AI tools used in our organisation are compatible with existing IT systems.	1 2%	3 5%	10 16%	30 48%	19 30%	63 100%
2	The AI tools are easy to integrate without requiring major system upgrades.	1 2%	3 5%	12 19%	29 46%	18 29%	63 100%
3	The complexity of AI tools makes it difficult to implement them effectively.	5 8%	15 24%	25 40%	15 24%	3 5%	63 100%
4	Our organisation has reliable data infrastructure to support AI applications.	2 3%	4 6%	13 21%	28 44%	16 25%	63 100%
5	AI tools in our organisation are scalable to meet growing operational needs.	1 2%	3 5%	12 19%	29 46%	18 29%	63 100%
6	Poor connectivity (example., internet) hinders AI tool performance.	4 6%	12 19%	25 40%	16 25%	6 10%	63 100%

Table 3: Technological Factors – Softcodes International Limited

Description	Rating Scale					Total
	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	

1	The AI tools used in our organisation are compatible with existing IT systems.	1 6%	2 12%	5 29%	7 41%	2 12%	17 100%
2	The AI tools are easy to integrate without requiring major system upgrades.	1 6%	2 12%	6 35%	6 35%	2 12%	17 100%
3	The complexity of AI tools makes it difficult to implement them effectively.	3 18%	5 29%	6 35%	2 12%	1 6%	17 100%
4	Our organisation has reliable data infrastructure to support AI applications.	1 6%	3 18%	6 35%	5 29%	2 12%	17 100%
5	AI tools in our organisation are scalable to meet growing operational needs.	1 6%	2 12%	6 35%	6 35%	2 12%	17 100%
6	Poor connectivity (example., internet) hinders AI tool performance.	2 12%	4 24%	7 41%	3 18%	1 6%	17 100%

Table 4: Technological Factors – NetPlusDotCom Limited

S/N	Description	Rating Scale					Total
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	
1	The AI tools used in our organisation are compatible with existing IT systems.	1 4%	2 7%	6 21%	13 46%	6 21%	28 100%
2	The AI tools are easy to integrate without requiring major system upgrades.	1 4%	2 7%	7 25%	12 43%	6 21%	28 100%
3	The complexity of AI tools makes it difficult to implement them effectively.	2 7%	6 21%	10 36%	8 29%	2 7%	28 100%
4	Our organisation has reliable data infrastructure to support AI applications.	1 4%	3 11%	7 25%	11 39%	6 21%	28 100%
5	AI tools in our organisation are scalable to meet growing operational needs.	1 4%	2 7%	7 25%	12 43%	6 21%	28 100%
6	Poor connectivity (example., internet) hinders AI tool performance.	2 7%	5 18%	11 39%	8 29%	2 7%	28 100%

Sidmach exhibits high technological readiness with 78% (48% Agree, 30% Strongly Agree) conorganisationing the compatibility of the AI tools, 75% (46% Agree, 29% Strongly Agree) rating the tools for easy integration, high scalability with 75%, and efficient data infrastructure with 69%. However, connectivity problems (40% Neutral, 35% Agree/Strongly Agree) pose a major problem, showing the infrastructural deficiencies in Nigeria (Microsoft, 2021). The moderate level of complexity concerns (40% Neutral) indicates installation difficulties, aligning with the nature of technological acquisition by SMEs (Kopka, Fornahl, 2024).

The technology readiness of Softcodes is moderately low, with 53% (41% Agree, 12% Strongly Agree) being in agreeance with AI tool compatibility and 47% (35% Agree, 12% Strongly Agree) for ease of integration. Connectivity issues (41% Neutral, 24% Agree/Strongly Agree) and infrastructural issues with data management (35% Neutral) pose some challenges, which may relate to infrastructural challenges faced by regions such as South Africa (Adebayo & Musa, 2024). Issues related to complexity are less so (35% Neutral, 47% Disagree/Strongly Disagree), suggesting manageable implementation challenges.

Technological readiness scores are high at NetPlusDotCom, with 67% (46% Agree, 21% Strongly Agree) expressing co-organisationation concerning the compatibility of the AI-tool, while 64% (43% Agree, 21% Strongly Agree) find ease of integration. However, scalability at 64% and data infrastructure at 60% are favorable, while connectivity at 39% Neutral and 36% Agreement/Superior Agreement still pose a problem, just like the digital economy in Nigeria (Microsoft, 2021). Additionally, complexity (36% Neutral) suggests moderate implementation difficulties.

Test of Hypothesis

H₀: Technological factors (AI tool compatibility and complexity) have no significant influence on organisational operational efficiency in selected Nigerian IT Firms.

Table 5: Test of Hypothesis - Influence of Technological Factors on Organisational operational Efficiency

Hypothesis	Variable	Coefficient (β)	t- value	p- value	Significance	Model Summary
H₀1: Technological factors have no significant influence on organisational operational efficiency	AI Tool Compatibility	0.58	6.72	< 0.001	Significant	R ² = 0.42, Adjusted R ² = 0.40, F(2, 105) = 37.84, p < 0.001
	AI Tool Complexity	-0.31	-3.89	0.002	Significant	

The validity of the hypothesis has been verified through the regression analysis, which shows the significance of the technology aspects on the operational efficiency of the organisation, thereby nullifying H_01 . The positive effect on the measurement criteria like operational efficiency and satisfaction is shown by the AI tool compatibility ($\beta = 0.58$, $p < 0.001$), as it supports smooth interaction with the current systems. However, the results also indicate the negative effect on operational efficiency due to the complexity of the AI tools ($\beta = -0.31$, $p = 0.002$) during their application in the organisation, especially when there are less technical capabilities. The total variance explained by the model is 42% with significance ($p < 0.001$).

Discussion

The examined how much the technological factors of AI tool compatibility and complexity influence organisational operational efficiency in selected Nigerian IT organisations. The regression analysis rejected the null hypothesis (H_01), meaning that there was a significant influence at $R^2 = 0.42$, $p < 0.001$. AI tool compatibility was positive drivers of the performance, with $\beta = 0.58$, $p < 0.001$, while AI tool complexity exerts negative effects, with $\beta = -0.31$, $p = 0.002$. On the other hand, the complexity of AI tools stands in the way of its adoption, with a mean of 3.15. At Softcodes, 35% were neutral about the ease of use of the AI tool, and 47% wholly disagreed. This will demand more training to integrate the technologies, hence further delaying the integration and reducing performance outcomes. Third is organisational operational efficiency, with a mean of 3.95. This implies that the high operational efficiency at Sidmach reflects in AI-driven automation of processes which has resulted in reducing the time it takes to develop software, as supported Hassan (2024) argued that such efficiency gain is up to 25%.

Summary

The study investigated the influence of technological factors on organisational operational efficiency in selected Nigerian Information Technology (IT) Firms, which included Sidmach Technologies Nigeria Limited, Softcodes International Limited, and NetPlusDotCom Limited. The study adopted a quantitative design which made use of a sample size of 125 across the three organisations and 108 were retrieved yielding 86.4%% response rate. Collected data from a five-point Likert scale questionnaire was analysed using descriptive and inferential statistics like multiple regression analysis and SPSS Sorftware. Findings reflected technological factors significantly influenced organisational operational efficiency. AI tool compatibility positively enhances performance by facilitating seamless integration, with a regression coefficient of $\beta = 0.58$ ($p < 0.001$), while AI tool complexity negatively impacts performance ($\beta = -0.31$, $p = 0.002$) due to implementation challenges, particularly in resource- constrained organisations like Softcodes International Limited.

Conclusion

The findings of this study highlight the transformative potential of AI in enhancing organisational operational efficiency within Nigeria's IT industry. The findings suggest that Nigerian IT Organisations can achieve competitive advantages by leveraging AI, provided they address barriers through strategic interventions.

Recommendations

These findings led the study to recommend that:

- i. Investment in organisations that have compatible and user-friendly AI investment tools: IT organisations, especially small ones like Softcodes International and NetPlusDotCom, should invest their resources in acquiring AI tools that are fully compatible with the systems used by these companies and that have low complexity.
- ii. Partnerships with cloud vendors: These should be strengthened by the IT organisation, as it can provide scalable interoperable solutions which lower implementation costs and increase operational efficiency.

References

- Adebayo, T., & Musa, R. (2024). AI-driven customer personalisation in Nigeria's retail sector: Impacts on sales and customer satisfaction. *Journal of African Business Technology*, 12(3), 45–60.
- Aina, S. (2025). Artificial intelligence adoption in Nigeria's education technology sector: A mixed-methods analysis. *African Journal of Innovation and Technology*, 15(1), 22–38.
- Brynjolfsson, E., & McAfee, A. (2023). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies* (2nd ed.). W.W. Norton & Company.
- Hassan, R. (2024). AI in Nigeria's supply chain sector: Opportunities and challenges. *African Journal of Logistics and Supply Chain Management*, 11(1), 34–49.
- Li, H., & Qin, J. (2023). AI-driven diagnostics in healthcare: A quantitative study. *Health Informatics Journal*, 29(2), 67–82.
- Merhi, M., & Harfouche, A. (2023). Regulatory policies and AI adoption in the U.S. automotive sector. *Journal of Policy and Technology*, 18(1), 55–70.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
- Nwachukwu, T., & Dada, O. (2024). Infrastructural barriers to AI adoption in Nigerian SMEs. *Journal of African Entrepreneurship*, 13(2), 66–82.
- Oseni, A. (2024). E-Service adoption and local Government transformation in Nigeria. *African Journal of Governance and Development Studies*, 11(1), 45–62.