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Moderating roles of digital competence on accounting information system and employee productivity in the Nigerian manufacturing industry

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Abstract

This research aimed at examining the moderating roles of digital competence on the relationship between Accounting Information Systems (AIS) measured by information quality (IFQ), data quality (DAQ), service quality (SEQ), system quality (SYQ), and employee productivity (EMP). Out of the 500 copies of the questionnaire distributed to the management staff of the sampled manufacturing firms in South-South, Nigeria, 481 questionnaires were returned. The questionnaire items were coded using a 5-point Likert scale. The Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze the sourced data. Although the AIS success factors (IFQ, DAQ, SEQ, and SYQ) improve EMP, digital competence (DIC) further enhances the AIS-EMP relationship, suggesting that employees perform better when they have access to high-quality information, reliable service support, accurate data, and well-functioning systems. Employees who work in highly digitally inclusive environments experience greater productivity gained from high information quality, service excellence, data integrity, and system reliability. The study underscores that if firms invest in improving their employees' digital skills through technology-driven training, employees will become more productive. Additionally, Nigerian manufacturing firms should enhance their service delivery, maintain a strong database, and ensure robust system functionality should they desire to improve their employee productivity.

Keywords: Digital competence, Accounting information system (AIS), Employee productivity, Nigerian manufacturing industry.

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1. Introduction

The present rise in the integration of digital tools in the workplace globally has positioned automated information systems (AIS) as a key tool for improving organizational efficiency and productivity. The rationale is that AIS helps to reduce human errors, streamline organizational processes, and enhance firms' decision-making processes. Basically, AIS is designed to automate workflow, enhance communication efficiency, and improve data processing, with the central goal of achieving higher employee productivity. Nevertheless, the extent to which AIS enhances organizational performance is dependent on the firms' approach towards AIS. This, therefore, suggests that the integration of AIS into business operations may not guarantee enhanced employee productivity and that for AIS to improve employee productivity, it also requires a high level of digital competence to achieve [1, 2].

Venkatesh et al. [3] stressed that digital competence ensures that employees adapt to emerging technologies without stress. Hence, it is expected that employees with high digital competence can seamlessly integrate AIS into their workflow better than employees with low digital competence. Similarly, employees with high digital competence are expected to make more informed and faster strategic decisions than those with low digital competence. Hence, the extent to which AIS results in higher employee productivity is dependent on the extent of integration of IT competence. This further suggests that employees in the Nigerian manufacturing sector will continue to struggle to leverage AIS optimally until they have adequate digital skills. Justifiably, employees in the Nigerian manufacturing industry can only perform their operations seamlessly if they are able to interact with industrial IoT (IIoT), robotic systems, enterprise resource planning (ERP) software, and computer-aided manufacturing (CAM) solutions effectively. Hence, digital competence is highly essential given the present-day demand for highly digitally competent employees, especially in the manufacturing industry [4].

Despite the widespread integration of digital competence and AIS in terms of information, data, system and service quality, management scholars mainly focused on either direct impact of AIS on employee productivity/organizational performance or on the direct impact of digital competence on employee productivity/organizational performance, with no attention on the effect on the moderating roles of digital competence on the relationship between AIS and organizational productivity. As such, most existing studies failed to investigate the moderating effect of digital competence on the relationship between AIS and organizational productivity, especially in the Nigerian manufacturing industry may lead to reduced operational efficiency, high levels of resistance to technology adoption, and under-utilization of digital channels and ultimately low organizational performance. Specifically, this research aims to examine the direct impact of AIS on employee productivity; identify the key digital competencies that employees in the manufacturing industry need to achieve optimal organizational productivity; and investigate the moderating roles of digital competence on the relationship between AIS and organizational productivity.

By addressing this knowledge gap and examining these relationships, this article will contribute meaningfully to the broader discussions in AI integration, especially in the African context. Also, the research is expected to have huge policy and managerial implications, offer insights into how Nigerian manufacturing firms can develop technology adaptation strategies, and also enable them on how best they can train their employees in emerging areas in IT.

2. Literature Review and Hypothesis Formulation

2.1. AIS and Its Relevance in the Nigerian Manufacturing Industry

AIS are well-organized framework that is used to source, record, process, and report both accounting and financial data within a manufacturing firm. It therefore aligns accounting principles with IT, with the central goal to ensure that firms' decisions are accurate and in tandem with best accounting practices. More so, AIS involves the integration of the human resource (accountants, auditors, management and other stakeholders), procedures and instructions, data, hardware, software, and internal control and security measures to improve the reliability and accuracy of financial reports. By digitalizing accounting processes, AIS reduces human errors, streamlines organizational processes, and enhances firms' decision-making processes. Again, AIS is designed to automate workflow, enhance communication efficiency, improve data processing with the central goal to achieve higher employee productivity. Given the fact that the Nigerian manufacturing industry is highly competitive, the integration of AIS into the industry will enhance organizational performance significantly by assisting employees with the needed tools to perform their roles more efficiently and contribute immensely to overall firm growth.

2.2. Employee Productivity

Employee productivity (EMP) remains one of the critical factors that determine a firm's going concern. The term "EMP" entails how efficiently employee performs their task and assigned responsibilities [5]. It therefore covers the quality and quantity of works that an employee performs within a specified period of timeframe [6]. More so, EMP is a key factor in determining the extent an employee contributes to the going concern of the firm [7]. EMP predictors can be measured by the quantity of works (in terms of number of tasks which the employee complete, sales made etc.), quality of work (in terms of attention to details, meeting deadlines, and accuracy), time management (in terms of effective time management, minimizing waste and prioritizing tasks) and employee efficiency (in terms of ability to finish assigned duties and responsibilities with less supervision, error and waste). Meanwhile, EMP can be improved through AIS and integration of digital competence (DIC).

2.3. Digital Competence (DIC)

DIC is the ability of an employee to use digital/modern technologies in the most efficient and effective manner. It therefore involves a range of skillset, attitudes, and knowledge which enable employees to traverse, communicate, and work

in a highly competitive, dynamic and digitalized work environment [7]. Key components of DIC is digital literacy, information literacy, communication and collaboration, digital content creation, digital citizenship, digital safety and security and critical thinking and problem solving [8].

2.4. Theoretical Framework

The ISSM was used to develop the research framework. ISSM is a comprehensive framework designed to evaluate and understand the factors that contribute to the success of IT/IS. The ISSM was developed by DeLone and McLean [9] but was updated in DeLone and McLean [10] and Mueller and Urbach [11]. DeLone and McLean [10] identify six (6) key factors that influence the success of IS/IT: system quality, information quality, service quality, usage, user satisfaction, and net benefits [10]. Further, the ISSM emphasizes how each of the six (6) factors is interrelated by arguing that high system quality can result in better information quality, increase users' satisfaction, and at the same time, improve the adoption rates.

Furthermore, the ISSM highlights the role of IS/IT capabilities in fulfilling process requirements. Strong technological features, such as reliable reach, effective financial data representation, and robust monitoring capabilities, are essential for mobile banking apps. By improving these aspects, banks can enhance user trust and satisfaction. Implementing advanced security measures, for example, can alleviate concerns regarding data protection, which is a significant barrier to adoption. By leveraging the insights from the ISSM, organizations can strategically enhance their mobile banking solutions, ultimately fostering greater adoption and user satisfaction among finance professionals.

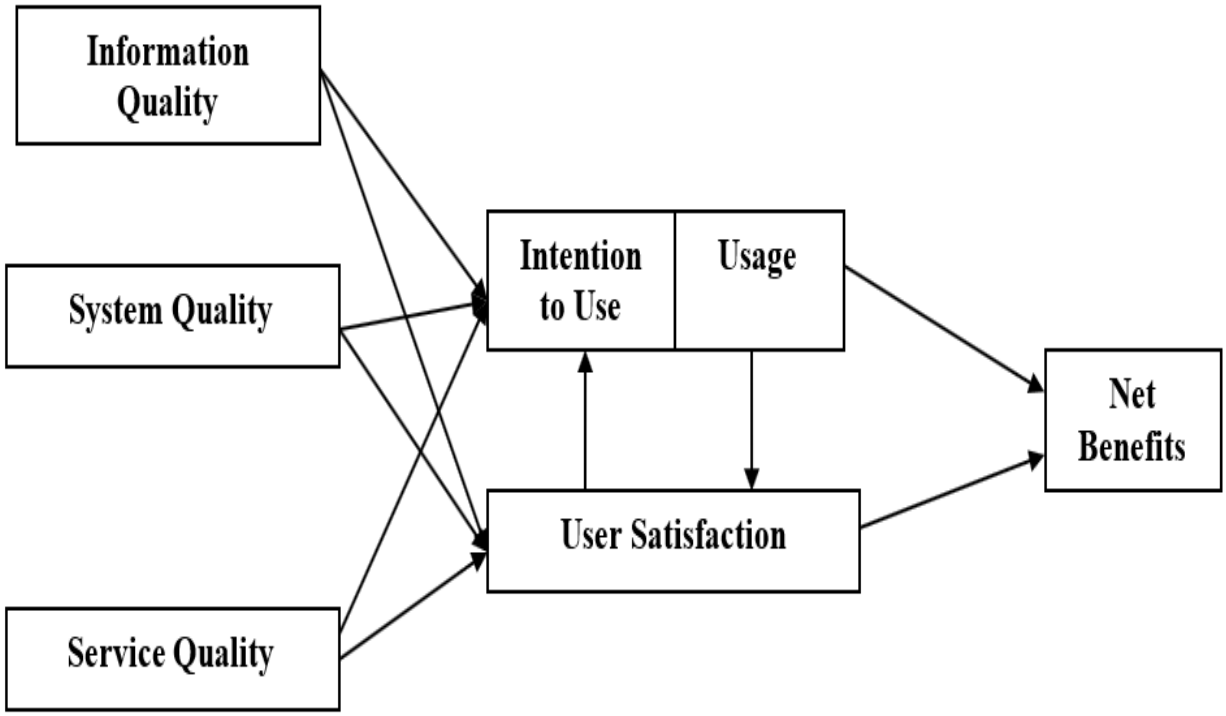

Figure 1.
Updated ISSM.
Source: DeLone and McLean [10].

This theory is appropriate for the study because the model provides valuable insights into addressing the challenges faced by mobile banking apps. The model also stresses the importance of ensuring that the mobile app's usability and design are seamless. As such, simplifying interfaces will help users with low digital skills navigate the mobile app easily and increase their adoption rates.

Table 1.
Summary of Empirical Literature.

S/N	Author and Year	Focus	Country	Method of Analysis	Source of Data	Major Findings
1	Astika and Dwirandra [12]	IT competence and employee performance	Indonesian	Multiple Regression Analysis (MRA)	Primary data (modified questionnaire)	IT's usefulness improves employee performance
2	Riyadh, et al. [13]	AIS and Employee Performance: Emphasis on SMEs	Indonesia	MRA	Quantitative data - Questionnaires	AIS (information, system, and service quality) improves employee productivity
3	Jarah, et al. [14]	AIS and employee performance: Emphasis on Jordan Islamic banks	Jordan	SEM-PLS method	Primary Data - Questionnaire	AIS (information, system, and service quality) enhances employee performance
4	Sow [15]	AIS and organizational effectiveness	China	Quantitative Research	Interviews (convenience sampling)	AIS design and specifications enhances user satisfaction and organizational performance
5	Pitafi, et al. [16]	IT competence and work cooperation on employee performance	China	Quantitative Research	Survey-based empirical approach	ESM usage improves work performance through task interdependence
6	Chien and Hu [17]	Employee computer self-efficacy	Taiwan	Quantitative analysis	Data from 116 ERP users	ERP training and learning significantly improve ERP effectiveness
7	Lai, et al. [18]	Employee agility and IT competency	China	Quantitative Research	Questionnaire	IT competence is positively related to task interdependence and autonomy
8	Nguyen, et al. [19]	Technology-based knowledge sharing and employee performance	Vietnam	Job demands-resources model	Survey data from 281 employees	Tech-based knowledge sharing affects job performance directly and indirectly
9	Asyari and Hamid [20]	Digital competency and bank employee performance	Indonesia	Moderated analysis techniques	Data from 56 employees	Digital competence significantly influences employee performance
10	Huu [21]	Systematic review on digital competence and work behaviour	Global	Systematic Review	Scientific publication databases	Digital competence and autonomy promote employee creativity
11	Garini and Muafi [22]	Digital competence and employees' performance	Indonesia	PLS-SEM analysis	Qualitative data from PT. X employees	Digital competence does not affect service performance, but positively impacts work-life balance and stress
12	Dhaniswara, et al. [23]	Digital Competence and Knowledge Sharing on Employee Performance	Indonesia	PLS-SEM analysis	Questionnaire data from tax educator employees	Digital competence and work motivation significantly influence employee performance

13	Vo et al. [24]	Employee job performance and digital skills	Vietnam	PLS-SEM analysis	1200 email surveys	CBA positively affects EJP and OPP
14	Heslina and Syahruni [25]	Information technology's influence on employee performance	Indonesia	MRA	Questionnaire	IT has a positive and significant effect on employee performance
15	Hwang, et al. [26]	Employees' digital competence and the use of tele-presence	Korea	PLS-SEM analysis	Primary Data - Questionnaire	Tele-presence influences employees' continued metaverse use significantly through informativeness, interactivity, and enjoyment

2.5. Hypothesis Formulation

Consistent with the ISS model and AIS-EMP literature**,** this study formulated five (5) hypotheses. They are hypothesized thus:

2.5.1. Information Quality and Employee Productivity

Another critical factor that affects employee productivity is the quality of information. This parameter places emphasis on precision, accuracy, timeliness, understandability, sufficiency and conciseness of the information that is available to the employee [27, 28]. Hence, it is assumed that if information is well processed, accessed precisely, accurately, timely sufficient, it will reduce uncertainty and miscommunication and also improve employee productivity.

$H_{1:}$ Information Quality enhances employee productivity significantly

2.5.2. Service Quality and Employee Productivity

Service quality plays a major role in enhancing employee productivity since it ensures that employees are given the needed organizational support to perform their tasks in the most efficient manner [29]. Various factors that characterized a high-service quality are: high level of responsiveness, user support, efficiency, reliability, and high level of accessibility. Ahli et al. [30] stressed that if employees are given the needed support, they are expected to perform better. Also, reliable service delivery improves workflow efficiency, reduces delays, frustration, and anger in the workplace [31]. Further, well-designed support systems assist employees on the best approach of overcoming challenges quickly. By encouraging a highly supportive and efficient work environment, high service quality will result to enhanced employee satisfaction, enhanced employee performance, and overall organizational success.

$H_{2:}$ Service Quality enhances employee productivity significantly

3. Data Quality and Employee Productivity

Data quality is another critical factor that affects employees. This parameter places emphasis on precision, accuracy, timeliness, understandability, sufficiency and conciseness of the data that is available to the employee [27, 28]. Hence, it is assumed that if data is easily accessed, precise, accurate, timely, and sufficient, it will reduce the times spent to execute tasks, interpret data, and also make strategic decisions [32].

$H_{3:}$ Data Quality enhances employee productivity significantly

4. System Quality (SYQ) and Employee Productivity

This parameter examines the overall quality of the AIS. This parameter plays key roles in achieving higher employee productivity as it addresses issues such as response time, ease of access, reliability, system functionality, flexibility, integration, and importance. As such, highly-responsive AIS allow employees to perform their roles seamlessly without minimal disruption. According to Egieya et al. [33], well-designed AIS enables employees spend less time on error correction, manual data entry, and troubleshooting. It also enables them to make strategic decisions. Putri et al. [34] documented that a functional and highly reliable AIS enhances collaboration, reduces downtime, and reduces errors, thereby leading to an enhanced operational performance. Further, seamless integration of AIS into other digital applications also removes redundancies and at the same time enhances workflow efficiency [35]. Overall, robust and efficient AIS reduce frustration, increase employee morale, and enhance overall productivity, thereby making SYQ a key factor in organizational productivity.

$H_{4:}$ System Quality enhances employee productivity significantly

4.1. Digital Competence (DIC), AIS Success Factors, and Employee Productivity (EMP)

A digital competent employee stands out among other employee as it will enable employee to optimize workflows, reduce hours spent in performing an assigned duty, enable employees focus on higher –value tasks, improve communication and collaboration in the workplace, enable employees to access information and resources needed to make strategic decisions, increase flexibility and autonomy in the workplace, and ultimately improve EMP. Justifiably, **DIC** strengthens the AIS-EMP

relationship**,** suggesting that employees are expected to benefit from the integration of SEQ into AIS more; the more their digital skills are fully harnessed.

H_5: DIC moderates the IFQ-EMP relationship both positively and significantly.
H_6: DIC moderates the SEQ-EMP relationship both positively and significantly.
H_7: DIC moderates the DAQ-EMP relationship both positively and significantly.
H_8: DIC moderates the SYQ-EMP relationship both positively and significantly.

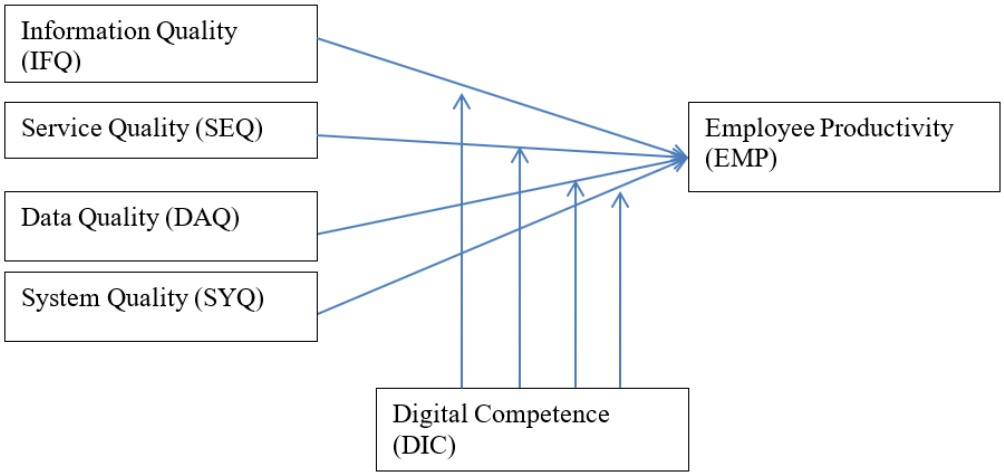

Figure 2.
Moderating Roles of DIC on AIS and EMP.

5. Methodology

This research aimed at examining the moderating roles of digital competence on the relationship between AIS success factors, namely information quality (IFQ), data quality (DAQ), system quality (SYQ), and service quality (SEQ) and employee productivity (EMP). The study focused on the management staff of manufacturing firms in South-South, Nigeria. The choice of management staff is these cadres are more abreast on AIS success factors than those at the lower cadre. Given the large population, economy of time and cost, the proportionate stratified random sampling method was used in determining a sizeable sample size of 500 persons among the 15 manufacturing firms in the geographical area. However, 481 questionnaires were returned. The AIS success factor items were adapted from the works of Ali et al. [36]. Each item was coded using 5 Likert scale of 1 to 5. While 1 was coded as strongly disagreed, 5 denotes strongly agreed. The modified questionnaire was validated from the earlier works of researchers.

The Partial Least Squares Structural Equation Modelling (PLS-SEM) was used in analyzing the data gathered from the field survey. Accordingly, the PLS-SEM follows a dual-step estimation technique. The first step is to test for the measurement model while the second step is to test for the structural model. Specifically, the measurement model was used to test the reliability and the validity of the of the model using Cronbach alpha (CA) values, item loading (IL), Average Variance Extracted (AVE) values, Composite reliability (CR), discriminant validity (DV), Coefficient of Determination (R^2), Predictive Relevance (Q^2), and goodness of fit (GoF). Meanwhile, the structural model was used to test the five (5) research hypotheses stated earlier in section 2 using path coefficients, t-statistics (t-value), and p-values. The various findings are presented and discussed in the next section of this research.

6. Result Estimation and Discussion

This section covered four major sub-sections. The first sub-section addresses the respondents' profile; the second sub-section addresses the measurement model; the third sub-section addresses the structural model: hypothesis testing; the fourth sub-section addresses the discussion and practical implications of each finding.

6.1. Respondents' Profile

The respondents' profile accounts for the respondents' age bracket (years), the respondents' qualifications, and the respondents' working experience. It is presented in Table 2:

Table 2.
Respondents' Profile.

		Frequency (F)	Percentage (%)	Cumulative Percentage (%)
Age Brackets (Years)	20 to 30 Years	109	22.66	22.66
	31 to 40 years	123	25.57	48.23
	41 to 50 years	147	30.56	78.79
	51 years and Above	102	21.21	100.00
Academic Qualification	SSCE	151	31.39	31.39
	OND	117	24.32	55.72
	HND/BSc	159	33.06	88.77
	MSc/MBA	41	8.52	97.30
	PhD	13	2.70	100.00
Working Experience	1 to 10 Years	197	40.96	40.96
	11 to 20 years	193	40.12	81.08
	>20 years	91	18.92	100.00

Table 2 evidenced that those ages 20 to 30 years, are 109 respondents (22.66% of the 481 respondents), those ages 31 to 40 years are 123 respondents (25.57% of the 481 respondents), those ages 41 to 50 years are 147 respondents (30.56% of the 481 respondents) while those 51 years and above are 102 respondents (21.21% of the 481 respondents). The outcome is presented in Figure 3.

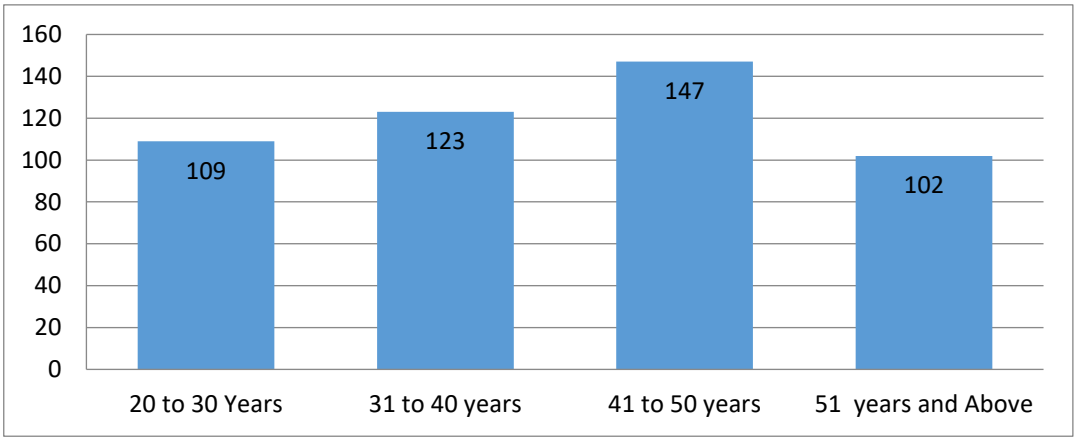

Figure 3.
Respondents' Age Bracket (Years).

Furthermore, 151 respondents (31.39% of the 481 respondents) are SSCE holders, 117 respondents (24.32% of the 481 respondents) are OND holders, 159 respondents (33.06% of the 481 respondents) are HND/BSc. holders, 41 respondents (8.52% of the 481 respondents) are MSc/MBA holders, while 13 respondents (2.70% of the 481 respondents) are PhD holders. The outcome is presented in Figure 4.

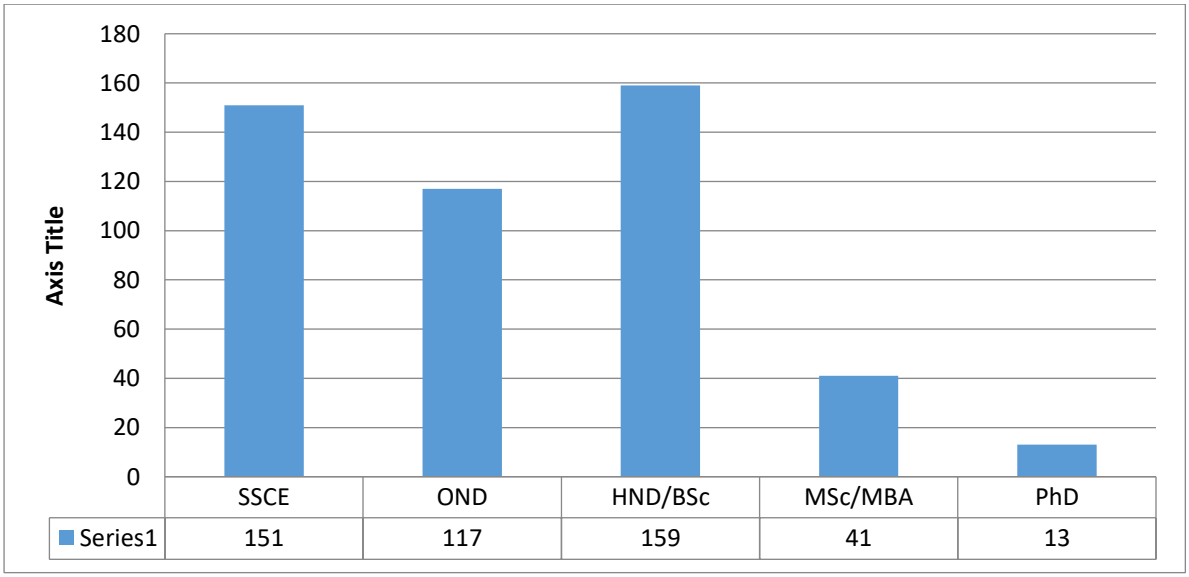

Figure 4.
Respondents' Academic Qualifications.

Additionally, 197 respondents (40.96% of the 481 respondents) have worked from 1 to 10 years, 193 respondents (40.12% of the 481 respondents) have worked from 11 to 20 years, while 91 respondents (18.92% of the 481 respondents) have worked over 20 years. The outcome is presented in Figure 5.

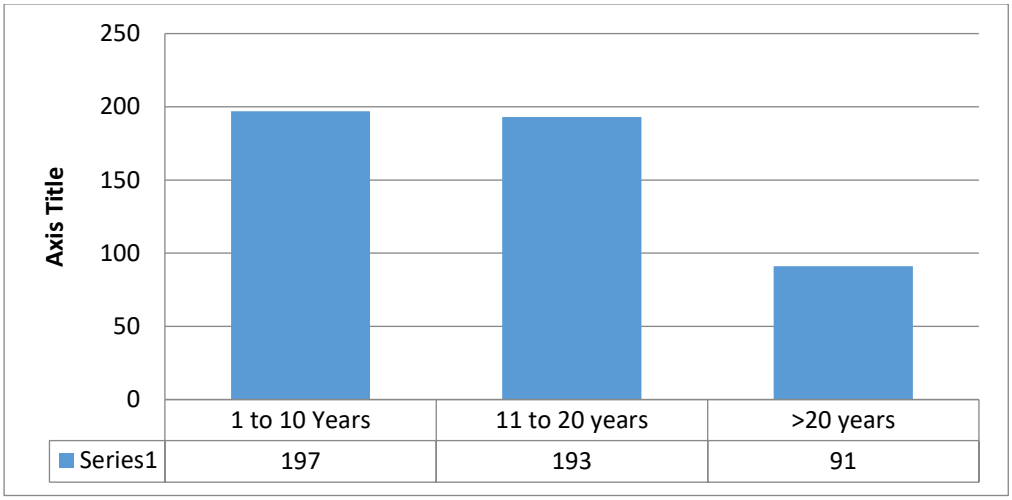

Figure 5.
Respondents' Academic Qualifications.

6.2. PLS-SEM Measurement Model

The PLS-SEM measurement model was used to ascertain the reliability and the validity of the model using CA values, items range, loadings, AVE values, Composite reliability, discriminant validity, R^2, Q^2, and GoF. These measurement criteria are shown in Table 2. As earlier mentioned, independent variables is AIS factors measured by Information quality (IFQ), System quality (SYQ), Service quality (SEQ), and Data quality (DAQ), while employee productivity (EMP) as the dependent variable. More so, digital competence (DIC) served as the moderating variable (Table 3).

Table 3.
Instrument's Reliability and Validity

Variable	Items Range	Loading Range	CA	CR	AVE
Information quality (IFQ)	IFQ1- IFQ12	0.702-0.801	0.945	0.949	0.612
Service Quality (SEQ)	SEQ1-SEQ8	0.676-0.806	0.902	0.921	0.603
Data Quality (DAQ)	DAQ1-DAQ6	0.822-0.867	0.912	0.942	0.716
System Quality (SYQ)	SYQ1-SYQ12	0.741-0.821	0.922	0.931	0.613
Digital Competence (DIC)	DIC1-DIC12	0.611-0.789	0.924	0.941	0.519
Employee Productivity (EMP)	EMP1-EMP11	0.736-0.779	0.941	0.952	0.569

As reported in Table 3, IFQ has items ranging from IFQ1 to IFQ12, SEQ has items ranging from SEQ1 to SEQ8, DAQ has items ranging from DAQ1 to DAQ6, SYQ has items ranging from SYQ1 to SYQ12, DIC has items ranging from DIC1 to DIC12, and EMP has items ranging from EMP1 to EMP11, suggesting that the questionnaire total items is 62. The questionnaire items are robust enough to make inferences.

Furthermore, IFQ item loadings range between 0.702-0.801, SEQ item loadings range between 0.676-0.806, DAQ item loadings range between 0.822-0.867, SYQ item loadings range between 0.741-0.821, DIC item loadings range between 0.611-0.789, while EMP item loadings range between 0.736-0.779. Similarly, IFQ has a CA value of 0.945, SEQ has a CA value of 0.902, DAQ has a CA value of 0.912, SYQ has a CA value of 0.922, DIC has a CA value of 0.924 and EMP has a CA value of 0.941. Since all the variables of interest have CA values above 0.7, it suggests that the instrument is reliable [37]. Also, the CR values for all the variables of interest are above the minimum CA benchmark value of 0.7, suggesting that the instruments are internally consistent [38].

With items loading values surpassing the benchmark value 0.60 and AVE values surpassing the benchmark value 0.50 suggests that all the items are sufficient to establish the data's validity [39].

Having confirmed that the instrument is internally consistent, highly reliable, and that the AVE is higher than the estimated correlations among each pair of constructs, the next step is to test if the constructs are statistically distinct and are not overlap. The Discriminant Validity Table using the Fornell-Larcker Criterion (FLC) was used to ascertain if the constructs are statistically distinct and is not overlap and is presented in Table 4a:

Table 4a.
Discriminant Validity.

	IFQ	SEQ	DAQ	SYQ	DIC	EMP
IFQ	0.782					
SEQ	0.592	0.777				
DAQ	0.338	0.678	0.846			
SYQ	0.528	0.647	0.541	0.783		
DIC	0.598	0.597	0.618	0.612	0.720	
EMP	0.581	0.625	0.711	0.536	0.685	0.754

Table 4a reports the discriminant validity using the FLC. The result reported the diagonal Values (√AVE) stated in bold and the Off-Diagonal Correlations unbolded. While the diagonal value accounts for the square root of the AVE for each construct (√AVE), the off-diagonal values (un-bolded) account for the correlations between each construct. The decision rule for the constructs to be statistically distinct and are not overlapping is that the diagonal Values (√AVE) stated in bold must be higher than the highest off-diagonal correlations (unbolded). Justifiably, Table 3 evidenced that the diagonal values (√AVE) for each construct are higher than the off-diagonal suggesting good discriminant validity exist. This further suggests that each construct is distinct and is not excessively overlap with other constructs. Evidently, the correlation between DAQ and EMP of 0.711 is high but the √AVE value of DAQ of 0.846 is still higher, which further confirms that the model is theoretically sound. The summary of the discriminant validity is presented in Table 4b:

Table 4b.
Summary of Discriminant Validity

Construct	Diagonal Value (√AVE)	Highest Off-Diagonal Value	Discriminant Validity?
IFQ	0.782	0.592 (SEQ)	✅ Yes
SEQ	0.777	0.678 (DAQ)	✅ Yes
DAQ	0.846	0.741 (SYQ)	✅ Yes
SYQ	0.783	0.741 (DAQ)	✅ Yes
DIC	0.720	0.685 (EMP)	✅ Yes
EMP	0.754	0.711 (DAQ)	✅ Yes

Table 5.
Quality Criteria.

Quality Criteria	Q^2	R^2	GoF
Computed Value	0.562	0.521	0.559
Benchmark Values	0.350	≥ 0.33	0.36

Table 5 reports three (3) key quality criteria (model evaluation) metrics. Specifically, the Q^2 (Predictive Relevance) value of 0.562 is far above the benchmark value of ≥ 0.350, suggesting AIS and DIC effectively predict EMP outcomes. Also, the R^2 (Coefficient of Determination) computed value of 0.521 is above the benchmark value of ≥ 0.33, suggesting that 52.1% of the variance in EMP is explained by the four AIS factors and DIC. This further revealed a highly predictive model. Lastly, the GoF value of 0.559, which exceeds the benchmark value of 0.36, confirmed that the model fits well, exceeding the.

6.3.PLS Structural Model

This sub-section focused on the test of the five-research hypothesis. Emphasis here is on the path coefficients, t-value, and p-value of significance level. Table 6 reports the structural model without the moderating variable (direct effect), while Table 7 reports the structural model output with the inclusion of the moderating variable (indirect effect).

6.3.1. Structural Model Output (Direct Effect)

This sub-section presents the structural model without considering the moderating variable**.** The emphasis here is to test the direct relationships between the four AIS factors (IFQ, SEQ, DAQ, and SYQ) and employee productivity (EMP).

Table 6.
Structural Model Output (Direct Effect).

Path Relationship	Hypotheses	Path Coefficient	T-Value	P-Value	Significance Level	Comments
IFQ -> EMP	H1	0.389	2.483	0.017	5%	H1 Supported
SEQ -> EMP	H2	0.380	3.069	0.004	1%	H2 Supported
DAQ -> EMP	H3	0.319	2.046	0.047	5%	H3 Supported
SYQ-> EMP	H4	0.716	5.882	0.000	1%	H4 Supported

The explanations for the four (4) hypotheses tested are given below.

Hypothesis 1 (H1)

In the case of HI, a positive path coefficient value of 0.389 was reported suggesting that IFQ is improves EMP. Also, IFQ reported t-value of 2.483, p-value of 0.017 and 1% significant level suggesting the H1 (IFQ -> EMP) is valid.

Hypothesis 2 (H2)

In the case of H2 (SEQ -> EMP), a positive path coefficient value of 0.380 was reported, suggesting that SEQ improves EMP. Also, SEQ reported a positive t-value of 3.069 and a p-value of 0.004 confirming 1% significance level. This therefore revealed that H2 (SEQ → EMP). Thus, H2 (SEQ -> EMP) is valid.

Hypothesis 3 (H3)

For H3 (DAQ -> EMP), a positive path coefficient value of 0.319 was recorded, suggesting that DAQ influences EMP positively. Similarly, DAQ had a positive t-value of 2.046 and a p-value of 0.047, confirming that DAQ is significant at a 5% significance level. This further confirmed that H3 (DAQ → EMP) is valid.

Hypothesis 4 (H4)

The structural model reported that SYQ has a positive path coefficient value of 0.716, suggesting that 1% rise in SYQ increases EMP by 71.6%. Meanwhile, SYQ reported a t-value of 5.882 and a p-value of 0.000, confirming that H4 is significant at the 1% level. This further suggests that H4 (SYQ → EMP) is valid.

6.3.2. Structural Model Output (Indirect Effect)

In this study moderating effect of digital competence was tested in the relationship between AIS success factors and employee productivity. In PLS-SEM analysis, the moderating effect is said to exist if the interaction term is significant. Justifiably, the interaction paths are said to be significant if the t-value of each path is above 1.96 and the p-value is below 0.05 [39]. The structural model output evidencing the indirect effect (i.e., the moderated regression) is presented in Table 7.

Table 7.
Moderated Regression Output.

Interaction Path Relationship	Hypotheses	Path Coefficient	T-Value	P-Value	Significance Level	Comments
IFQ*DIC -> EMP	H5	0.563	6.107	0.000	1%	H5 Supported
SEQ *DIC-> EMP	H6	0.743	6.429	0.000	1%	H6 Supported
DAQ *DC-> EMP	H7	0.493	3.605	0.001	1%	H7 Supported
SYQ*DIC-> EMP	H8	0.518	5.977	0.000	1%	H8 Supported

Hypothesis 5 (H5):

As reported in Table 7, H5 (IFQ * DIC → EMP) recorded a positive path coefficient value of 0.563 suggesting that DIC strengthens the positive relationship between IFQ and EMP. The t-value of 6.107 (>1.96) and p-value of 0.000 (<0.05) confirm that this indirect effect is statistically significant at the 1% level. This further suggests that higher DIC enhances the impact of IFQ on employee performance. Therefore, H5 (IFQ * DIC → EMP) is supported.

Hypothesis 6 (H6):

H7 reported a positive path coefficient value of 0.743 suggests that DIC moderates the relationship between SEQ and EMP positively. The t-value of 6.429(>1.96) and a corresponding p-value of 0.001 (<0.005) suggesting that this indirect effect is statistically significant at the 1% level. This evidenced that as DIC increases, the impact of SEQ on EMP becomes more obvious. Hence, H6, which posit that DIC moderates the positive relationship between SEQ and EMP is supported

Hypothesis 7 (H7):

For H7, the positive path coefficient value of 0.493 suggests that DIC moderates the relationship between DAQ and EMP positively. The t-value of 3.605 (>1.96) and p-value of 0.001 (<0.05) confirm that this indirect effect is statistically significant at the 1% level. This evidence that as DIC increases, the impact of DAQ on EMP becomes more obvious. Hence, H7, which posit that DIC moderates the positive relationship between DAQ and EMP is supported.

Hypothesis 8 (H8):

H7 reported a positive path coefficient value of 0.518 suggests that DIC moderates the relationship between SYQ and EMP positively. The t-value of 5.977 (>1.96) and p-value of 0.001 (<0.005) confirm that this effect is statistically significant at the 1% level. This evidence that as DIC increases, the impact of SYQ on EMP becomes more obvious. Hence, H8 which posit that DIC moderates the positive relationship between SYQ and EMP is supported

Discussions and Practical Implications

The digital age has transformed conventional accounting systems, drifting from manual accounting processes to AIS. Usually, AIS assist management in solving short-term operational issues while aligning with long-term strategic goals [40]. It is in this regard that the current study focuses on the direct effect of AIS success factors on employee productivity (EMP). Given the complexity inherent in the integration of AIS into the accounting system, DIC was incorporated into the model to serve as the moderating variable.

The findings underscore that IFQ is a major factor that improves EMP significantly (H1: Coeff=0.380, t-value=2.483, and p-value=0.017). By implication, employees perform more efficiently if they access high-quality information easily. This result further stressed on the need for precision, accuracy, timeliness, understandability, sufficiency and conciseness of the information that is available to the employee [27, 28]. Hence, it is assumed that if information is well processed, access precise, accurate, timely, and sufficient, it will reduce uncertainty and miscommunication and also improve employee

productivity. Additionally, DIC strengthens the IFQ-EMP relationship, suggesting that, employees are expected to benefit from the integration of IFQ into AIS success factor more; the more their digital skills are fully harnessed.

Similarly, service quality (SEQ) is a key positive driver of EMP. Hence, the study reinforced the idea that efficient SEQ enhances employee efficiency and effectiveness. By implication, well-designed support systems assist employees on the best approach of overcoming challenges quickly. By encouraging a highly supportive and efficient work environment, high service quality will result to enhanced employee satisfaction, enhanced employee performance, and overall organizational success. [30] reported that if employees are given the needed supports, they are expected to perform better. Also, reliable service delivery improve workflow efficiency, reduces delays, frustration, and anger in the workplace [31]. Additionally, DIC strengthens the SEQ-EMP relationship, suggesting that, employees are expected to benefit from the integration of SEQ into AIS more; the more their digital skills are fully harnessed

In regard to data quality (DAQ), this study reported that while DAQ improves EMP significantly, DIC strengthens the DAQ-EMP relationship. By implication, if data is easily accessed, precise, accurate, timely, and sufficient and that the digital skills of employees are properly harnessed, it will reduce the times spend time to execute task, interpret data, and also make strategic decisions [27, 28, 32].

Again, the study clearly confirmed that system quality (SYQ) is a major positive driver of employee productivity. This aligns with DeLone and McLean's [9] submission that higher SYQ improves system usage and user satisfaction which in turn improves individual EMP. Similarly, Egieya et al. [33] reported that well-designed AIS enable employees spend less time on error correction, manual data entry, and troubleshooting. Putri et al. [34] also documented that a functional and highly reliable AIS enhances collaboration, reduces downtime, and reduces errors, thereby leading to an enhanced operational performance. Further, seamless integration of AIS into other digital applications also removes redundancies and at the same time enhances workflow efficiency [35]. By implication, high SYQ helps employees to work efficiently, make strategic decisions, reduce firm's operational costs, increase response rate to employee demands, and also reduce time wasted on system failures. However, if AIS is poorly designed, it hinders employee productivity as it causes delays, frequent errors, and frustration. Additionally, DIC strengthens the SYQ-EMP relationship, suggesting that, employees are expected to benefit from the integration of SYQ into AIS more; the more their digital skills are fully harnessed

7. Concluding Remarks and Recommendations

The study reiterates that AIS success factors—IFQ, SEQ, DAQ, and SYQ—significantly enhance employee productivity, and that DIC further strengthens these relationships. Hence, the study underscores that employees perform better when they have access to high-quality information, reliable service support, accurate data, and well-functioning systems. In this regard, the study concludes that employees who work in highly digitally inclusive environments experience greater productivity gained from high information quality, service excellence, data integrity, and system reliability. As such, if firms invest in improving their employees' digital skills through technology-driven training, employees will become more productive. Additionally, Nigerian firms should enhance their service delivery, maintain strong data governance, and ensure robust system functionality should they desire to improve their employee productivity. This is because such actions create a more efficient work environment where employees can fully leverage AIS to perform at their best.

The major contribution made is that the study advanced studies of AIS by introducing DIC into the AIS-EMP model. Additionally, the study bridges the gap between AIS-EMP relationships by stressing the need to prioritize employee digital skills over investment in capital assets. Furthermore, the study contributes to theory by using the ISS model to underpin the research. Above all, the uniqueness of this research is anchored in the integration of DIC into the AIS-EMP model with a focus on the African context. Nevertheless, a number of limitations must be addressed. First, the study was confined to management staff of manufacturing firms in South-South, Nigeria. This could limit the generalization of our findings. To address this, future research should focus on at least four (4) geopolitical zones of Nigeria. Moreover, the inclusion of an interview schedule would have increased the validity of this research. Hence, future researchers are expected to conduct an interview schedule. Again, the current research focused on manufacturing firms, which again limits our study to the manufacturing industry. Future researchers are expected to cover a wider range of industries. This will help the audience appreciate the industry differences. Lastly, the researchers' actions should be directed towards using web-based questionnaires, given the fact that they are less costly, timely, and stress-free compared to the physical distribution of questionnaires.

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