

Digitalisation and supply chain integration in Northwest Nigerian hospitality: impact on service quality, operational efficiency and employee satisfaction

Olamide Olusegun, Inyang Nyongessien, Sambo Garba,
Adebisi Adewole and Ayodele Adetuyi
University of the West of Scotland, Paisley, UK

Abstract

Purpose – This study examines the factors leading to low service quality in the hospitality industry in northwestern Nigeria, emphasising the lack of digitalisation and supply chain integration. The sector faces challenges, such as security issues and reduced investor and tourist numbers, which affect productivity. Our study explores how digital tools and integrated supply chains can enhance service quality by highlighting employee satisfaction and customer service.

Design/methodology/approach – Using a mixed-methods approach, we conducted a web-based survey with 100 hotel employees, semi-structured interviews with six hotel managers and an analysis of relevant organisational documents. Quantitative data were analysed using linear regression and descriptive statistics.

Findings – We identified the interconnections between digital transformation, supply chain integration, employee satisfaction and service quality, culminating in the development of a Digital Integration Satisfaction Model (DISM).

Research limitations/implications – This study provides useful insights into digital transformation in hospitality but has several limitations. It focuses solely on Northwest Nigeria, limiting generalisability. The small interview sample, while achieving thematic saturation, may not reflect broader managerial views. Reliance on self-reported data raises the risk of response bias. Data were collected over six months, so recent changes may be missed. Additionally, the study emphasises service quality and efficiency, omitting financial metrics like ROI or cost savings, which could provide a more comprehensive assessment.

Originality/value – This study aligns with the technology-organisation-environment (TOE) framework, supply chain management model, Herzberg's two-factor theory and SERVQUAL model, using the terms digitalisation and technology adoption interchangeably. This study advances the understanding of the critical role of digitalisation and supply chain integration in enhancing hospitality sector performance in a challenging regional context, contributing to both theoretical models and practical insights.

Keywords Digitalisation, Supply chain integration, Employee satisfaction, Service quality, Supply chain management

Paper type Research article

1. Introduction

The Nigerian hospitality industry is at a crucial juncture, requiring continuous innovation to meet the ever-growing expectations of technology-savvy and demanding customers. While budget-friendly hotels are prevalent, achieving customer satisfaction remains a significant challenge due to insurgency in Nigeria's northern region, particularly driven by groups such as Boko Haram and its splinter factions, which have had a profound and detrimental impact on the tourism and hospitality sectors. Persistent insecurity, characterised by violent attacks, kidnappings, and the



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destruction of infrastructure, has deterred both domestic and international tourists from visiting the region (Ojo, 2020). This decline in tourism has led to reduced revenue for hotels, restaurants, and other hospitality-related businesses, many of which have been forced to close or scale back operations (Mgabhi and Ezeuduji, 2023). Fear of insurgent activities has also disrupted supply chains, making it challenging for hospitality providers to maintain consistent services (Jawabreh *et al.*, 2023). Moreover, the negative perception of safety in the region has discouraged investment, further stalling the development of tourism infrastructure (Abu, 2025).

Consequently, insurgency has not only undermined the economic potential of the hospitality sector but has also led to significant job losses, exacerbating poverty and instability in the region. Another significant challenge is service quality (Ezenta and Uwabor, 2021). These researchers convincingly argued that service quality is heavily influenced by employee satisfaction, training, and customer support. Effective supplier relationships are the cornerstone of service quality, necessitating supply chain integration (Kathawala and Nauo, 1989). A hotel's supply chain, which includes customers, suppliers, departments, and clients (Espino-Rodríguez and Taha, 2022), reflects its service quality and how well it delivers on promises (Berry *et al.*, 1989). This is assessed through tangibles, customer service, process quality, physical evidence, assurance, and empathy (Berry *et al.*, 1989; Ezenta and Uwabor, 2021).

Insurgency, particularly the Boko Haram crisis, has significantly disrupted supply chain integration in Northern Nigeria's tourism sector. Persistent insecurity has led to a decline in tourist arrivals, adversely affecting businesses that rely on tourism. This decline disrupts the supply chain by reducing demand for goods and services and decreasing production and distribution activities. Insurgency has also caused infrastructural damage, impeding transportation networks that are essential for effective supply chain operations. Damaged roads and bridges hinder the transport of goods and tourists, leading to delays and increased operational costs. Aigbavboa and Ojadi (2019) highlights that companies operating in insurgency-affected regions have had to adopt various risk mitigation strategies to maintain resilience. These strategies include risk avoidance, retention, reduction, and transfers. However, the tourism sector, which is heavily dependent on perceptions of safety, faces unique challenges in effectively implementing such strategies. Furthermore, insurgency has tarnished the region's image as a tourist destination. Negative perceptions deter potential visitors, leading to a further decline in the tourist inflow. This decline affects not only direct tourism services but also ancillary services, such as hospitality, transportation, and local artisans, thereby disrupting the entire supply chain network associated with tourism.

Digitalisation and supply chain integration are transforming the hospitality industry globally. In northwestern Nigeria, where the hospitality sector is flourishing, embracing digital technologies and integrating supply chains are essential to improve service quality. Digitalisation involves using digital tools across operations, from reservations to management (Ristova and Dimitrov, 2019), and creates seamless stakeholder collaboration (Sodhi and Tang, 2016). Customers increasingly use mobile apps and digital platforms for bookings, recommendations, and reviews (Ristova and Dimitrov, 2019). This significantly affects customer choices and brand perceptions (Cantallops and Salvi, 2014). Previous research suggests that evaluating supply chain performance should consider social factors alongside financial metrics (Pagell and Wu, 2009). This is particularly relevant in the hospitality industry, where effective supplier management is crucial due to outsourcing (Elhoushy *et al.*, 2020). Digitalisation has been a key player in bridging information gaps between customers and suppliers for over two decades.

Supply chain integration entails the seamless coordination of various stakeholders, including external suppliers, internal departments, and customers, to enhance operational efficiency (Imam, 2023). This integration transcends traditional operational boundaries. Hotels prioritise establishing close, long-term relationships with selected suppliers and fostering customer involvement to gather information regarding their needs and feedback (Zhong *et al.*, 2016). This strategy enables hotels to adapt to evolving economic conditions and customer expectations, balancing traditional hospitality values with modern technological

solutions (Giannoukou, 2024). However, while supply chain integration is often idealised in supply chain management, research indicates that, in practice, many supply chains lack effective integration. This study explores the dynamic relationship between digitalisation and supply chain integration in the northwestern Nigerian hospitality industry, offering valuable insights into the industry's current state. This study examines the factors contributing to low service quality in the hospitality sector in northwestern Nigeria, emphasising the absence of digitalisation and supply chain integration. The sector faces challenges such as security issues and reduced investor and tourist numbers, which impact productivity. This study investigates how digital tools and integrated supply chains can enhance service quality by emphasising employee satisfaction and customer service. This study posits that digitalisation and supply chain integration are crucial for improving service quality and operational efficiency in the hospitality industry in northwest Nigeria with the development of the Digital Integration Satisfaction Model (DISM), highlighting the interdependence of these factors. Despite significant challenges such as infrastructural deficits, security concerns, and digital literacy gaps, targeted strategies focusing on infrastructure investment, staff training, and secure supply chain mechanisms can promote operational efficiency and resilience. The findings underscore that context-specific approaches are essential for effectively leveraging digital opportunities within the region's unique socioeconomic and security landscape, ultimately contributing to sector growth, enhancing customer experiences, and increasing competitiveness.

1.1 Research questions

- (1) What is the current state of digitalisation and supply chain integration among hospitality establishments in northwest Nigeria?
- (2) How does digitalisation affect operational efficiency and service quality within the hospitality industry in northwest Nigeria?
- (3) What are the barriers to improving digitalisation and supply chain integration in the hospitality industry in Northwest Nigeria?

1.2 Hypotheses

1.2.1 Hypothesis 1.

H0. Customer feedback positively impacts service quality

H1. Customer feedback negatively impacts service quality

1.2.2 Hypothesis 2.

H0: Utilisation of digital tools positively impacts operational efficiency

H1: Utilisation of digital tools negatively impacts operational efficiency

2. Literature review

2.1 Digitalisation and supply chain integration in the hospitality industry

The hospitality industry is undergoing significant transformation because of the widespread adoption of digital technologies (Sigala *et al.*, 2020). Hotels in northwestern Nigeria are increasingly integrating solutions such as property management systems, online booking platforms, and mobile applications (Wang *et al.*, 2022).

This digital shift reshapes business operations and societal dynamics, necessitating adaptation to a volatile and ambiguous world (Wang *et al.*, 2022; Ristova and Dimitrov, 2019). Early insights, such as those from Hansen and Owen (1995), predicted the transformative role

of technology in hospitality, showcasing innovations such as multifunctional guest keys and kiosks that enhance efficiency and service quality. Worker satisfaction is crucial for service quality, as motivated employees deliver better customer experiences (Ezenta and Uwabor, 2021). Larger hotels typically adopt digital technologies more extensively; however, research indicates that management, operations, and guest services drive technology adoption across all hotel sizes. Digitalisation has a positive impact on service quality by improving worker satisfaction.

2.2 Worker satisfaction and its impact on service quality

Academics and industry leaders focus on the relationship between worker satisfaction and service quality. Research by Bulgarella (2005), Evanschitzky *et al.* (2011), and Naseem *et al.* (2011) highlights how engaged employees create positive customer experiences, showcasing the significant impact of worker satisfaction on service quality.

Numerous studies have established a direct link between worker satisfaction and intrinsic motivation (Masvaure and Maharaj, 2014; Raza *et al.*, 2015; Sartono and Ardhani, 2016; Fishbach and Woolley, 2022). Intrinsic motivation enhances job satisfaction through self-determination and aligns personal values with work goals, thus contributing to reduced burnout. Herzberg's Two-Factor Theory emphasises that true motivation comes from recognition and growth opportunities, while job security and support drive satisfaction (Chi *et al.*, 2019).

A notable finding was the positive impact of employee satisfaction on customer-oriented behaviours. Heskett (1994) and Schneider and Bowen (2010) showed that satisfied employees are more likely to go the extra mile for customers, resulting in personalised services that enhance customer satisfaction (Hartline and Ferrell, 1996; Chi *et al.*, 2019). Happy employees also reduce service errors, leading to improved service accuracy (Grönroos, 2001) and commitment to quality (Hartline and Ferrell, 1996). However, despite the recognised benefits of employee satisfaction for service quality, challenges remain in the Nigerian context, especially in the northwestern region.

2.3 Challenges

Despite the evident benefits of digitalisation and supply chain integration, the northwestern Nigerian hospitality sector faces several challenges.

(1) Cost and Infrastructure

High initial investment costs, interoperability issues, and cybersecurity concerns can hinder the adoption of technology (Sigala *et al.*, 2020). However, successful implementation can enhance competitiveness, customer satisfaction, and operational efficiency (Xiang *et al.*, 2015). Emerging technologies such as blockchain can address supply chain challenges and improve transparency (Li *et al.*, 2019). Hotels may also struggle to integrate different digital systems, leading to data silos and operational inefficiency.

(2) Limited Connectivity

Although high-speed broadband penetration is increasing (Ejiofor *et al.*, 2020), the full potential of digitalisation hinges on reliable and affordable access to high-speed internet connectivity. However, infrastructure limitations, particularly in rural areas, can hinder internet access and slow digital adoption (Ejiofor *et al.*, 2020). This digital divide creates an uneven playing field, potentially marginalising smaller hotels in remote locations.

(3) Skill Gap

The rapid pace of digital transformation necessitates upskilling and reskilling of the workforce to effectively leverage digital technologies and platforms for business growth (Olusegun and Olusola, 2016). This skill gap presents a significant challenge for the Northwest Nigerian hospitality sector.

(4) Cultural and religious factors

Understanding sociocultural aspects is essential for successful digitalisation (Agbiji and Swart, 2015). Religious beliefs can shape guests' expectations for technology use, with some religions restricting digital activities at certain times. In northwestern Nigeria, religious norms influence customer perceptions of hotels, which should accommodate these practices by providing alternative options (Agbiji and Swart, 2015).

(5) Security Concerns

Security issues in Northern Nigeria have negatively impacted the hospitality industry by reducing investor and tourist numbers and hindering productivity (Ogunsusi and Adeleke, 2021; Ladan, 2023; Ojo *et al.*, 2023). Additionally, increasing reliance on digital technologies exposes hotels to cyber threats such as data breaches and malware attacks (Arcuri *et al.*, 2020; Gwebu and Barrows, 2020), leading to financial losses and reputational damage. Limited cybersecurity expertise in northwestern Nigeria further increases hotel vulnerability.

(6) Supply Chain Integration

Insurgency in Northern Nigeria has severely affected supply chain integration in the tourism sector by reducing tourist arrivals, damaging infrastructure (for instance, the destruction of communication towers in Kaduna), and creating negative perceptions of the region. Addressing these challenges requires comprehensive security measures and strategic risk management to restore confidence and to rebuild the tourism supply chain.

2.4 Theoretical frameworks and concepts

In the current hospitality industry, multiple interdependent factors continuously influence each other. Digital transformation, supply chain integration, employee satisfaction, and service quality are intricately connected, forming a dynamic system that plays a crucial role in determining an organisation's overall performance and success.

2.4.1 Technology-organisation-environment (TOE) framework. Widespread adoption of digital technologies in all aspects of an organisation. Frameworks such as the Technology-Organisation-Environment (TOE) framework (Tornatzky *et al.*, 1990) highlight the complex interplay between technology, organisational factors and the external environment, emphasising the importance of strategic alignment to leverage digitalisation effectively. Digitalisation can be a valuable, unique, rare, and non-replaceable resource, allowing businesses to streamline operations, personalise customer experiences, and gain a competitive advantage.

2.4.2 The supply chain management (SCM) theory. Supply chains are the primary source of any business, and go beyond the flow of physical goods. Supply Chain Management (SCM) theory emphasises the importance of integrating information, processes, and relationships throughout the chain from suppliers to customers (Storey *et al.*, 2006). This helps us understand the trade-off between market-based and internal transactions. This implies that digitalisation can facilitate seamless information sharing and collaboration, fostering more efficient and cost-effective supply chain integration.

2.4.3 Herzberg's two-factor theory. Employee satisfaction is not an additional element of the system. It is the heart and soul of the business. Herzberg's Two-Factor Theory (Herzberg, 1968) differentiates between hygiene factors (pay, working conditions) and motivators (recognition, growth opportunities). By addressing both through digital tools like e-learning platforms and performance feedback systems, organisations can foster intrinsic motivation and job satisfaction, improving performance and service quality. Suggesting digital tools can facilitate communication, transparency, and recognition and strengthen employee commitment and satisfaction.

2.4.4 The SERVQUAL model. The SERVQUAL model (Parasuraman *et al.*, 1988) identifies five service quality dimensions that drive customer satisfaction and loyalty: tangibles,

reliability, responsiveness, assurance, and empathy. Digitalisation enhances service quality through personalised interactions, real-time feedback, and efficient complaint resolution. CRM systems provide data-driven insights for targeted improvements, while empowering staff with customer data enables personalised services. Supply chain integration ensures timely delivery of quality products and services.

The synergistic interaction between these components is critical for hospitality success. However, challenges such as skill gaps and potential job displacement require workforce reskilling. Supply chain disruptions necessitate resilient risk management strategies, and ethical considerations regarding technology use and privacy concerns must be addressed.

2.5 Identifying research gaps across theories

The literature triangulates the following theories - SERVQUAL, Herzberg's two-factor theory, technology-organisation-environment (TOE) framework, and supply chain management (SCM) theory, to demonstrate the theoretical gap within the scope of this study because it adequately explains and addresses the research questions focusing on the Northwestern Nigerian context and extends the existing frameworks to provide a more comprehensive understanding of the subject matter.

SERVQUAL has been widely used to assess service quality, but there are significant gaps in its application, especially in the hospitality sector in Northwest Nigeria. This highlights the opportunity to explore how SERVQUAL can predict customer satisfaction and loyalty in the local industry. Existing studies (Herzberg, 1968) indicate potential disparities when applying Herzberg's theory to comprehend employee motivation and job satisfaction. Moreover, research gaps extend to utilising the TOE framework (Tornatzky et al., 1990) to examine the adoption and implementation of digital technologies within hospitality establishments in the same region. Additionally, there is a paucity of understanding of how external environmental factors, such as regulatory requirements or market competition, influence the adoption and utilisation of technology within the local hospitality sector in Northwest Nigeria.

Further research gaps are evident when applying SCM theory to analyse supply chain integration practices within the hospitality industry (Storey et al., 2006). Specifically, there is a need to investigate the impact of supply chain disruptions such as logistical challenges or supplier issues on the operational performance and customer satisfaction of hospitality establishments in this region.

The triangulation of SERVQUAL, Herzberg's Two-Factor Theory, the Technology-Organisation-Environment (TOE) Framework, and the Supply Chain Management (SCM) theories created the DISM model. The conceptual framework underpinning this study is illustrated in Figure 1.

2.6 The Digital Integration Satisfaction Model (DISM)

DISM suggests that the successful incorporation of digital technology into supply chain operations depends on the satisfaction levels of the workforce. This concept suggests that employees' satisfaction with their working environment, including interactions with digital tools and systems, improves service quality across the supply chain.

2.6.1 Core principles.

- (1) Digitalisation is the central focus of DISM, involving the implementation and merging of digital technology in all aspects of the supply chain, such as procurement, manufacturing, shipping, and customer service. These technologies include cloud computing, big data analytics, Internet of Things (IoT) devices, and artificial intelligence (AI) algorithms.
- (2) DISM stresses the significance of coordinating digitisation initiatives with supply chain integration objectives. This entails establishing integrated systems and procedures to

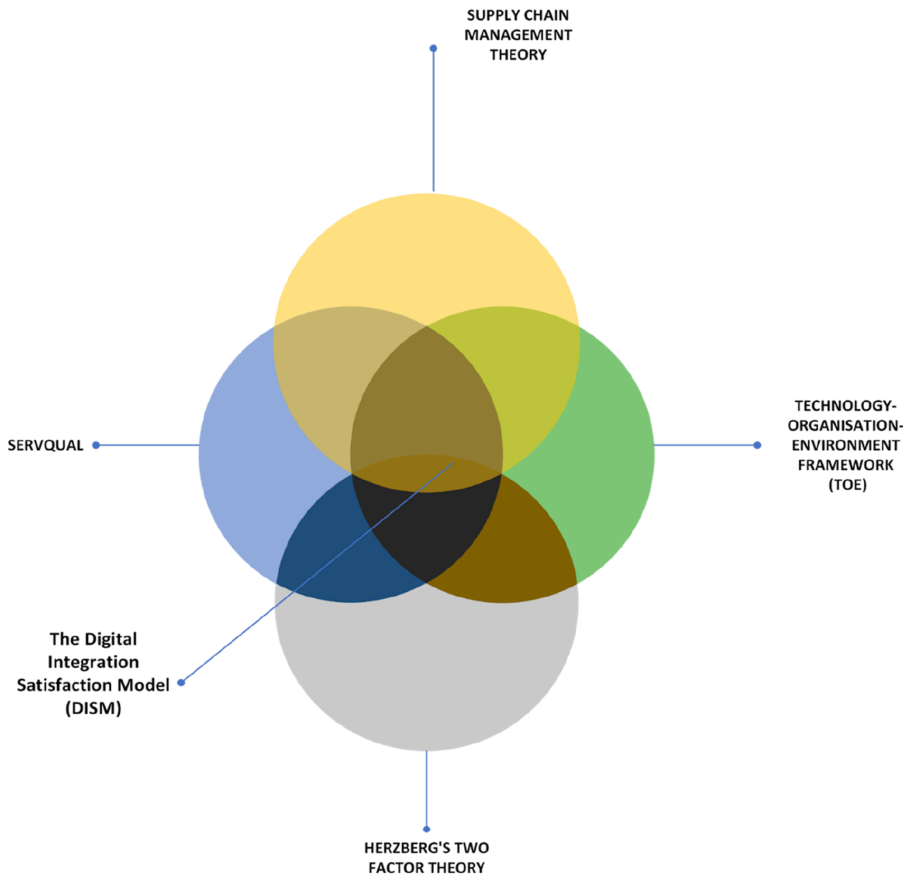


Figure 1. The Digital Integration Satisfaction Model (DISM). Source: Created by authors

provide smooth information exchange, cooperation, and alignment across different supply chain stakeholders such as suppliers, producers, distributors, and retailers.

- (3) DISM acknowledges the importance of employee happiness in facilitating effective digital integration activities. This highlights the importance of organisations focusing on job autonomy, training and development opportunities, supportive work culture, and effective communication channels to create a good work environment favourable to digital adoption.
- (4) DISM aims to improve the service quality across supply chains. Organisations may enhance efficiency, accuracy, and responsiveness in delivering products and services to clients by guaranteeing employee satisfaction and providing them with essential digital tools and resources. This results in increased consumer satisfaction and loyalty.

2.6.2 Application. The DISM provides a framework for organisations to strategically plan and implement their digitisation and supply chain integration projects, focusing on employee happiness. By utilising digital technology to optimise supply chain operations and empower staff, organisations may attain improved service quality, competitive advantage, and long-term success in the current dynamic business landscape. The framework is illustrated in [Figure 2](#) below.

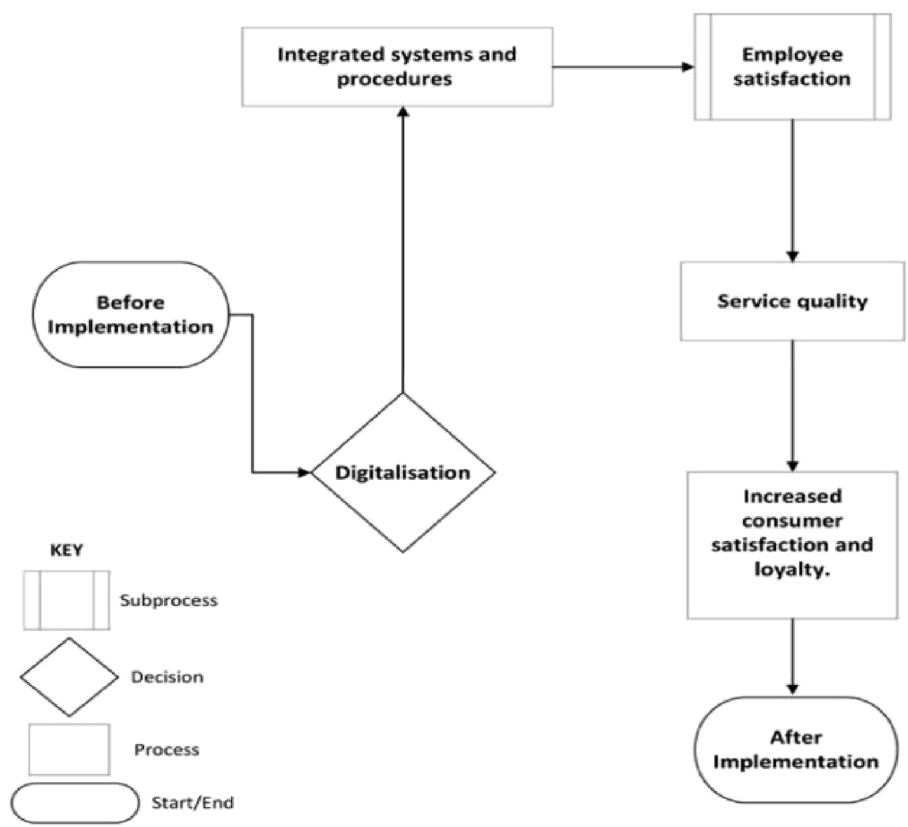


Figure 2. The taxonomy of the DISM model. Source: Created by authors

2.7 Research design

This study employs a mixed-methods approach to comprehensively investigate the relationship between digitalisation, supply chain integration, worker satisfaction, and service quality in the hospitality industry in Northwest Nigeria. Mixed-methods research is recognised for providing a holistic understanding of complex phenomena by integrating quantitative and qualitative data (Creswell and Creswell, 2017).

2.8 Sampling techniques and sample size determination

A stratified random sampling technique will be utilised to ensure representation from various segments of the hospitality industry in Northwest Nigeria. This method has been widely used in similar research contexts to ensure the diversity and representativeness of a sample (Babbie, 2016). Sample size determination will follow established guidelines for quantitative research, ensuring the statistical power and generalisability of the findings (Cochran, 1977).

2.9 Data collection methods

This study utilised a mixed-method approach to investigate the relationships among digitalisation, supply chain integration, worker satisfaction, and service quality in the hotel industry of Northwest Nigeria. Data collection employed three primary methods: (1) a web-based survey distributed to 100 hotel employees across various departments, using a 5-point

Likert scale to assess key variables; (2) semi-structured interviews with six hotel managers and employees, exploring contextual factors and in-depth perspectives; and (3) analysis of relevant organisational documents. This triangulation of methods, conducted over a 6-month period to account for seasonal variations, provided a comprehensive dataset for analysis. The study adhered to ethical guidelines throughout the data collection process, ensuring participants' confidentiality and informed consent. This multifaceted approach allows for both quantitative and qualitative exploration of the complex interplay between digital transformation, supply chain processes, and human factors in the hospitality sector.

2.10 Variables and measurement instruments

The measurement instruments will be adapted from the validated scales used in prior research. Digitalisation and supply chain integration will be assessed through Likert-scale items on technology adoption in hospitality operations (Hair *et al.*, 2019). Service quality can be evaluated using the SERVQUAL instrument (Parasuraman *et al.*, 1988).

2.11 Data analysis procedures

Quantitative data will be analysed using statistical techniques such as simple linear regression and descriptive statistics.

3. Data presentation and analysis

The data show that 60.8% of respondents were aged 26–35, while 21.6% were aged 18–25. The gender distribution was balanced, with 51.4% female and 48.6% male. A total of 55.4% had bachelor's degrees and 59.5% use hotels 1–3 times yearly. Of the respondents, 32.4% reported moderate digital tool use in their preferred hotels, while 24.3% reported extensive use. Regarding personal usage, 28.4% used digital platforms moderately, and 25.7% extensively. A total of 39.2% of respondents believed that digitalisation significantly improved hotel performance (see Tables 1 and 2).

Table 1. Summary of regression analysis (service quality vs customer feedback)

Hypothesis	Regression weight	<i>B</i>	<i>t</i>	<i>p</i> -value	Result
H0	Customer feedback positively impacts service quality	0.580	6.015	<0.001	Supported
H1	Customer feedback negatively impacts service quality				Not supported
R^2	0.354				
$F(1,66)$	36.182				

Source(s): Created by authors

Table 2. Summary of regression analysis (operational efficiency vs utilisation of digital tools)

Hypothesis	Regression weight	<i>B</i>	<i>t</i>	<i>p</i> -value	Result
H0	Hotel utilisation of digital tools positively impacts operational efficiency	0.674	5.791	<0.001	Supported
H1	Hotel utilisation of digital tools negatively impacts operational efficiency				Not supported
R^2	0.347				
$F(1,66)$	33.532				

Source(s): Created by authors

The main digital platforms in hospitality are on-site payment platforms (29.4%), Mobile Applications (16.20%), and Online Booking Platforms (10.30%). Most hotels use multiple platforms to enhance customer experience ([Appendix 1](#)). Key areas for digital improvement include front desks (17.60%), guest experiences (5.90%), and housekeeping (5.90%) (See [Table 3](#) and [Table 4](#)), with most hotels utilising multiple services ([Appendix 3](#)).

Implementation challenges included a lack of technical expertise (29.40%), cybersecurity concerns (5.90%), and high investment costs (5.90%), with most hotels facing multiple challenges ([Table 5](#) and [Appendix 2](#)). A total of 23.5% viewed worker satisfaction as crucial for service quality, and 35.3% strongly agreed. While 50% of the hotel service quality was satisfactory, only 13.2% were strongly satisfied. Customer feedback methods included observation (25.0%), online reviews (11.8%), and hybrid strategies (30.8%), which combined multiple approaches as shown in [Table 6](#). [Table 7](#) shows willingness to pay more for improved service quality.

Table 3. Most useful digital platforms for interaction with hotels

Digital platforms use	<i>N</i>	%
Mobile applications	11	16.2
None of the above	5	7.4
Online booking platforms	7	10.3
POS Payment Platform	20	29.4
Combination of two or more platforms	25	36.7
<i>Total</i>	<i>68</i>	<i>100</i>
Source(s): Created by authors		

Table 4. Areas of hotel service that can benefit the most from the use of digital technology

	<i>N</i>	%
Facilities and maintenance	1	1.5%
Food and beverage services	2	2.9%
Front desk and reception	12	17.6%
Guest experience and feedback management	4	5.9%
Room Service and housekeeping	4	5.9%
Combination of two or more area	45	66.2
<i>Total</i>	<i>68</i>	<i>100</i>
Source(s): Created by authors		

Table 5. The main challenges hotels face in using digital tools in their operations

Main challenges	<i>N</i>	%
Cybersecurity concerns	4	5.9%
High initial investment costs	4	5.9%
Lack of technical expertise	20	29.4%
None of the above	3	4.4%
Resistance from employees	3	4.4%
Combination of two or more challenges	34	50
<i>Total</i>	<i>68</i>	<i>100</i>
Source(s): Created by authors		

Table 6. Customer satisfaction feedback

Customer satisfaction feedback	<i>N</i>	%
Combination of the below	21	30.8
Customer observation	17	25.0
Guest feedback forms	5	7.4
Not sure	17	25.0
Online reviews and ratings	8	11.8
<i>Total</i>	68	100

Source(s): Created by authors**Table 7.** Pay more for improved service quality

Willingness to pay more	<i>N</i>	%
Maybe	3	4.4
No, not really	1	1.5
Yes, definitely	36	52.9
Yes, to some extent	28	41.2
<i>Total</i>	68	100.0

Source(s): Created by authors

3.1 Hypothesis 1

The dependent variable (service quality) was regressed on the predictive variable of customer feedback. The independent variable significantly predicted service quality. $F(1, 66) = 36.182$, $p < 0.001$. This indicates that customer feedback has a significant impact on service quality. Moreover, $R^2 = 0.354$ depicts that the model explains 35.4% of the variance in service quality as shown in Table 1.

Additionally, the coefficient was assessed to ascertain its influence on the criterion variable (Service Quality). H_0 evaluates whether customer feedback significantly and positively impacts service quality. The results reveal that customer feedback significantly and positively impacts service quality ($B = 0.580$, $t = 6.015$, $p < 0.001$). Hence, H_0 is supported.

3.2 Hypothesis 2

The dependent variable (operational efficiency) was regressed on the predicting variable for hotel use of digital tools. The independent variable significantly predicted operational efficiency. $F(1, 63) = 33.532$, $p < 0.001$. This indicates that the factor under study significantly impacts operational efficiency. Moreover, $R^2 = 0.347$ depicts that the model explains 34.7% of the variance in operational efficiency as shown in Table 2.

Additionally, the coefficient was assessed to ascertain the influence of the criterion variable (operational efficiency). H_0 evaluates whether utilising digital tools in hotels significantly and positively affects operational efficiency. The results reveal that the use of digital tools in hotels significantly and positively impacts operational efficiency ($B = 0.674$, $t = 5.791$, $p < 0.001$). Hence, H_0 is supported.

4. Discussion

This study explored the interrelationships among digitalisation, supply chain integration, employee satisfaction, and service quality within the hospitality sector of Northwest Nigeria, a

region facing security challenges, infrastructural constraints, and increasing demand for technological adaptation. The findings derived from both qualitative insights and quantitative analyses substantiate the hypothesised relationships and offer novel perspectives contextualised through the Digital Integration Satisfaction Model (DISM).

4.1 Digitalisation and operational efficiency

This study confirmed a significant positive correlation between the utilisation of digital tools and operational efficiency ($R^2 = 0.347, p < 0.001$). This finding corroborates the hypothesis that digital technologies facilitate streamlined hotel operations. Employees and managers reported that digital platforms such as online booking systems, on-site payment solutions, and CRM applications have reduced redundancies, minimised human error, and enhanced workflow coordination. These results are consistent with existing literature ([Ristova and Dimitrov, 2019](#); [Xiang et al., 2015](#)), reinforcing the notion that technological tools are essential for real-time communication, efficient front-desk management, and improved guest satisfaction. However, the degree of digital adoption varies across establishments and is primarily influenced by hotel size, funding capabilities, and access to reliable infrastructure. The digital divide, particularly between urban and rural hotels, restricts the uniform implementation of these tools. Qualitative data also indicated that while larger hotels adopted comprehensive digital solutions, smaller establishments relied heavily on manual systems because of cost and skill barriers.

4.2 Customer feedback and service quality

The regression analysis further supported the hypothesis that customer feedback significantly and positively influenced service quality ($R^2 = 0.354, p < 0.001$). Hotels that systematically collected and responded to customer feedback through online reviews, direct observations, or hybrid methods reported higher levels of service quality. This underscores the importance of feedback loops in service enhancement and aligns with the SERVQUAL model ([Parasuraman et al., 1988](#)), particularly in the dimensions of responsiveness and empathy. Moreover, qualitative interviews revealed that customer feedback mechanisms empowered employees to make proactive decisions, thereby enhancing not only customer experience, but also internal accountability and motivation. This aligns with the perspective that service quality reflects both the system efficiency and emotional intelligence of frontline workers.

4.3 The role of employee satisfaction

Although not directly examined within the regression models, employee satisfaction emerged as a pivotal mediator in the DISM model and the qualitative interviews. Employees from digitally advanced hotels reported elevated levels of job satisfaction owing to access to training, reduced workload, and a more organised work environment. In contrast, hotels with inadequate digital integration experience higher turnover rates, job dissatisfaction, and burnout, factors identified in Herzberg's Two-Factor Theory that adversely affect workplace motivation. This finding is particularly significant in Northwestern Nigeria, where insecurity and socioeconomic instability already challenge employee morale. When strategically implemented, digital tools can serve not only as operational enhancers, but also as psychological buffers that cultivate a more resilient and motivated workforce.

4.4 Supply chain integration and environmental constraints

While the study affirmed the influence of digitalisation on operational processes and service delivery, it also identified significant challenges in achieving comprehensive supply chain integration. Respondents highlighted security concerns such as insurgency and infrastructural damage as primary obstacles to maintaining consistent supplier relationships and ensuring timely deliveries. This fragmentation aligns with the findings of [Aigbavboa and Ojadi \(2019\)](#)

and corroborates the assertion of supply chain management (SCM) theory, which states that effective supply chain performance is contingent on stable and reliable networks. Moreover, the limited implementation of integrated platforms between suppliers and hotel systems impedes real-time inventory tracking, demand forecasting and quality control. Consequently, even when digital tools are adopted internally, their effectiveness is diminished by the inefficiency of the external linkages. The DISM model aims to address this issue by connecting integration efforts with workforce readiness and system harmonisation.

4.5 Barriers to digital and supply chain advancement

In alignment with the literature review, the predominant barriers to digital transformation were a lack of technical expertise (29.4%), concerns regarding cybersecurity (5.9%), and substantial capital investment requirements (5.9%). Furthermore, cultural and religious dynamics significantly affect both customer expectations and employee adaptability, complicating the uniform adoption of digital initiatives. These barriers are indicative of the broader socio-technical constraints outlined in the TOE framework (Tornatzky *et al.*, 1990), which acknowledges the influence of environmental, technological, and organisational factors on the diffusion of innovation.

4.6 Theoretical and practical contributions

This study extends the existing frameworks by synthesising the TOE, SERVQUAL, Herzberg, and SCM theories into the novel DISM model. The model contributes a holistic view of how digital transformation in hospitality is not merely a technical upgrade but a systemic change contingent on human factors and environmental stability. In practice, the findings advocate the following.

- (1) Targeted digital upskilling for staff to bridge capability gaps.
- (2) Resilience-focused supply chain strategies, such as local sourcing and multi-supplier networks.
- (3) Incremental technology investment based on ROI assessments and risk profiles.
- (4) Blended service feedback systems that combine digital analytics with human observations.

5. Conclusion

This study examines the dynamic interplay between digitalisation, supply chain integration, employee satisfaction, and service quality within the hospitality sector in Northwest Nigeria. Employing a mixed-methods approach that integrates surveys, interviews, and document analysis, this study identifies a robust, positive correlation between customer feedback and service quality, as well as between the utilisation of digital tools and operational efficiency. These findings substantiate the Digital Integration Satisfaction Model (DISM), which posits that digital transformation is a catalyst for both service excellence and employee engagement. This study emphasises that digitalisation enhances operational processes, promotes transparency, and contributes to an improved guest experience, particularly when integrated with supply chain functions and supported by a satisfied workforce. However, the implementation of these technologies has been hindered by infrastructure deficits, security challenges, limited digital literacy, and cultural sensitivity. Despite these obstacles, the potential for digital transformation in this region remains substantial, particularly when anchored in strategic planning, inclusive training, and risk-resilient supply chain models. In conclusion, enhancing hospitality performance in Northwest Nigeria is not merely a matter of adopting new technologies, but necessitates a systemic approach that integrates digital tools, human capital development, and secure, collaborative supply chains. These findings provide

6. Recommendations

Based on the findings of this study, the following recommendations are proposed: government entities and private hotel operators should prioritise investments in Internet infrastructure, cloud-based systems, and integrated hospitality software. Public-private partnerships could be utilised to expand broadband access to underserved areas, thereby ensuring equitable digitalisation across both urban and rural establishments. Continuous professional development and digital literacy programs should be established to equip employees with the skills necessary to meet the evolving technological demands. These training modules encompass CRM systems, digital payment processing, cybersecurity awareness, and data analytics. Hotels should implement scalable supply chain management platforms to facilitate real-time communication and collaboration with suppliers. Additionally, local sourcing strategies should be considered to reduce reliance on disrupted regional networks and to enhance supply chain resilience. Hotel managers should adopt hybrid feedback systems that integrate online reviews, digital surveys, and direct observation. These insights should be incorporated into operational processes to improve responsiveness and personalise service delivery. Policymakers should develop region-specific guidelines that support safe digitalisation, encourage local innovation, and provide regulatory clarity on cybersecurity, data privacy, and digital taxation. These policies should also consider the religious and cultural nuances unique to Northwest Nigeria.

7. Limitations of the study

Although this study offers valuable insights into digital transformation within the hospitality sector, several limitations warrant consideration. The research was confined to Northwest Nigeria, potentially restricting the generalisability of the findings to other regions with differing socioeconomic and security contexts. Although a mixed-methods approach was employed, the sample size for the interviews, comprising of six hotel managers, was relatively small. While this was adequate to achieve thematic saturation, a broader range of managerial perspectives might yield more comprehensive insights. The reliance on self-reported data from survey responses and interviews introduces the possibility of response or social desirability bias, particularly concerning satisfaction and operational practices. Data collection spanned six months, and any subsequent changes in technology usage or security conditions may not have been captured in the findings, indicating the need for longitudinal studies. Furthermore, this study concentrates on service quality and operational efficiency without addressing financial outcomes such as profitability, return on investment (ROI), or cost savings, which could offer a more holistic evaluation of digital transformation.

About the authors

Dr Olamide Olusegun is a Lecturer in the School of Business and Creative Industries at the University of the West of Scotland. With over a decade of experience as a procurement professional in Nigeria's public sector, she has developed a deep interest in the dynamics of governance and the effective allocation of public funds. Motivated by a desire to make a meaningful impact, Dr Olusegun is committed to promoting efficiency and accountability in public procurement documentation and management. Dr Olusegun holds a bachelor's degree in Management Information Systems and a master's degree in Marketing and Business Management. She further advanced her expertise by earning a PhD in Public Procurement from the University of the West of Scotland. Her doctoral research examines the impact of inadequate procurement documentation on the performance of Nigerian government ministries, departments, and agencies. Her work highlights the critical role of procurement processes in enhancing public sector performance and governance.

Inyang Nyongessien is an Associate Lecturer at the University of the West of Scotland (UWS), where she is pursuing a Ph.D. in Business Management. With over six years of teaching experience in secondary

and tertiary institutions, Inyang specialises in delivering research-informed instruction in business and management, with a focus on leadership, sustainability, and organisational strategy. She is in her final year of her PhD, she holds a Master of Business Administration (MBA) from UWS and a Bachelor of Science in Education (Business) from the University of Uyo, Nigeria. Inyang is a member of the Nigerian Institute of Management (Chartered) and the Institute of Chartered Accountants of Nigeria. Her research interests include Industry 4.0, new venture creation, supply chain management, and the intersection of technology and business innovation. Beyond academia, Inyang has professional experience as a business analyst and accountant, applying her expertise to improve organisational processes and revenue management. She has presented at multiple conferences, including the Annual Conference of the Centre for African Research on Enterprise and Economic Development (CAREED), and is committed to advancing research that bridges the gap between theory and practice. In her spare time, she volunteers with WeSaveLivesAfrica, a charity organisation, and enjoys reading motivational books, playing lawn tennis, and engaging in qualitative research.

Sambo Garba is a PhD candidate in Logistics and Supply Chain Management at the University of the West of Scotland within the School of Business and Creative Industries. His research focuses on the critical area of risk and resilience within small-scale grain-crop farming. Driven by a keen interest in enhancing the sustainability and security of agricultural supply chains, Sambo's work aims to understand and mitigate the challenges these vital actors face in the global food system face. Sambo is also interested in the hospitality sector as a researcher, recognising its connections to broader supply chain dynamics and its significance in tourism and leisure industries. This interest complements his research on agricultural supply chains, as both sectors rely heavily on efficient and resilient logistics systems.

Dr Adebisi Adewole is the Director of the Centre for African Research on Enterprise and Economic Development (CAREED) at the University of West of Scotland. He holds a PhD in Business Logistics and Supply Chain Management. He worked as a visiting professor at various times with several universities in London. Prior to his adventure into academia, Dr Adewole worked in the UK retail sector as a Supply Chain Systems Analyst with various food retailing organisations for upward of 10 years. He is the author of "Logistics and Global Value Chains in Africa". He is widely published in a number of other international journals.

Dr Ayodele Adetuyi is an accomplished academic with expertise in finance and accounting, enterprise and business development, management, and economic development. His research focuses on key global and organisational challenges, including economic policy, climate change and sustainability, business development, and corporate finance. Dr Adetuyi is deeply committed to teaching, with a strong emphasis on accounting and finance, corporate finance and auditing, ethics, and corporate governance. His future research aims to advance corporate development and economic policy, addressing critical issues in global and regional contexts. He actively seeks collaborations with organisations such as Kaplan International, the National Association of Proprietors of Private Schools (NAPPS), Covenant University Farms, Universal Parental Clinic, and BBC Professionals to enhance his research and teaching initiatives. Additionally, Dr Adetuyi possesses expertise in accounting and accountancy, auditing and assurance, business reconstruction, and business due diligence, offering valuable knowledge for knowledge exchange and practical application. Driven by a passion for sustainable development, he strives to contribute innovative solutions to the evolving landscape of business and economic challenges.

Ethical approval

Your application 23,465: Research Paper, submission reference 18,570, has been approved, with conditions, by the Business and Creative Industries SAIEC of the University of the West of Scotland.

Supplementary material

The supplementary material for this article can be found online.

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Corresponding author

Olamide Olusegun can be contacted at: lamide.akintola@gmail.com