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Assessment of Factors Influencing Digital Transformation in Hotels' Facility Management in Abuja Metropolis, Nigeria

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ABSTRACT

The hospitality industry in Nigeria faces increasing pressure to enhance operational efficiency and guest satisfaction, yet many hotels struggle to fully integrate advanced digital technologies into facility management (FM) practices. This gap is particularly evident in the Abuja Metropolis, where infrastructural limitations and inconsistent adoption strategies constrain performance. Guided by the Technology Acceptance Model (TAM), which emphasises perceived usefulness and ease of use as determinants of technology adoption, this study examines the extent, influencing factors, and impact of digital transformation in hotel FM operations. A quantitative survey design was employed, collecting data from 150 FM professionals across five purposively selected hotels using structured questionnaires. Descriptive statistics, Relative Importance Index (RII), Analysis of Variance (ANOVA), and linear regression were used to address the research objectives. The findings reveal varying adoption levels: while high-speed internet and energy-efficient systems are widely implemented, advanced solutions such as Internet of Things (IoT) devices and real-time communication tools lag behind. Guest expectations (RII = 0.83–0.93) and technical support (RII = 0.82–0.91) emerged as the strongest drivers of adoption, whereas cost and return on investment were less influential. Regression analysis indicated that digital transformation significantly improved FM outcomes, explaining 83.3% to 89.3% of variability in operational efficiency across hotels ($p < .001$). Nonetheless, interdepartmental communication remained a persistent weakness. The study recommends strategic investment in advanced digital tools, comprehensive digital transformation policies, and targeted staff training to optimise FM practices and strengthen competitiveness in Abuja's hospitality sector.

Keywords: Digital Transformation, Hotel Facilities, Facility Management, Operational Efficiency

INTRODUCTION

Facility management (FM) is a critical discipline that ensures the operational efficiency, safety, and comfort of built environments through the strategic management of physical infrastructure (Barrett, 1995). In the hospitality industry, FM plays a pivotal role in maintaining high-quality guest experiences by overseeing maintenance, energy systems, security, and other operational functions. The advent of digital technologies, including the Internet of Things (IoT), artificial intelligence (AI), cloud-based systems, and automation, has ushered in a new era of digital transformation, fundamentally reshaping FM practices worldwide (Berger, 2021). These technologies enable hotels to optimise energy consumption, streamline maintenance processes, enhance security, and improve guest satisfaction through personalised services. For instance, IoT-enabled sensors can monitor energy usage in real time, while AI-driven analytics predict maintenance needs, reducing downtime and costs (Atta & Talamo, 2020). This digital shift has become a cornerstone for competitive advantage in the global hospitality sector, where operational efficiency and guest experience are paramount.

In Nigeria, the hospitality industry is experiencing significant growth, particularly in Abuja, the nation's capital, which serves as a hub for tourism, business, and diplomatic activities (Gumel et al., 2020). Abuja's hotels cater to a diverse clientele, including international travellers and government officials, necessitating high standards of service and infrastructure. However, the adoption of digital technologies in FM within these hotels

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lags behind global trends, constrained by financial limitations, inadequate technological infrastructure, and a lack of technical expertise (Oluwaseun et al., 2021). Many hotels in Abuja still rely on manual or semi-automated systems for FM tasks, leading to inefficiencies such as high energy costs, delayed maintenance, and suboptimal guest experiences (Alhassan et al., 2023). For example, the absence of integrated building management systems (BMS) limits real-time monitoring of facilities, while resistance to change among staff further impedes digital adoption (Okumus et al., 2017).

The potential of digital transformation to address these challenges is substantial. Technologies like cloud-based property management systems (PMS) and IoT devices can enhance operational efficiency, reduce costs, and improve sustainability, aligning with global trends towards environmentally conscious hospitality (Busulwa et al., 2020). However, the extent to which Abuja's hotels have embraced these technologies remains underexplored, as does the impact of such adoption on FM practices. Moreover, factors influencing the adoption of digital tools—such as guest expectations, technical support availability, and cost considerations—require systematic investigation to understand their role in shaping FM strategies. The lack of comprehensive research on digital transformation in Nigeria's hospitality sector creates a knowledge gap, limiting the development of evidence-based strategies to enhance FM practices. This study aims to fill this gap by assessing the extent of digital transformation in FM practices within hotels in Abuja Metropolis, Nigeria.

Statement of the Problem

The hospitality industry in Abuja faces significant challenges in integrating digital technologies into FM practices, despite its growth and increasing demand for enhanced guest experiences. Many hotels struggle with operational inefficiencies, high maintenance costs, and outdated infrastructure, compounded by a technological lag that undermines competitiveness (Alhassan et al., 2023). Digital solutions like IoT devices and building management systems (BMS) promise improvements in energy efficiency, maintenance, and guest services, yet financial constraints, limited technical expertise, and resistance to change hinder progress (Okumus et al., 2017). Furthermore, limited research on digital transformation in FM within Nigeria's hospitality sector restricts understanding of its benefits and barriers. This study addresses these gaps by assessing the extent of digital technology adoption, identifying influencing factors, and evaluating its impact on FM practices in Abuja's hotels. The aim of this study is to assess digital transformation in hotel facility management practices in Abuja, Nigeria, to provide insights that enhance FM operations. The specific objective is to: identify the factors influencing the adoption of digital technologies in facility management in the study area.

LITERATURE REVIEW

Digital Transformation

Digital transformation refers to the integration of digital technologies into an organisation's operations, fundamentally altering how it functions and delivers value (Bounfour, 2016). In the hospitality industry, digital transformation involves adopting technologies such as IoT, AI, and cloud-based systems to enhance efficiency, guest experiences, and sustainability. These tools enable real-time data analysis, predictive maintenance, and personalised services, which are critical for competitive advantage (Busulwa et al., 2020). However, high implementation costs and skill gaps pose challenges, particularly in developing countries like Nigeria (Awosode & Ajayi, 2023).

Facility Management

Facility management (FM) encompasses the management of physical assets and infrastructure, including maintenance, energy management, security, and space optimisation, to ensure optimal functionality (International Facility Management Association, 2020). In hotels, FM is vital for maintaining guest satisfaction through seamless operations. Effective FM ensures that facilities like HVAC systems, lighting, and security meet operational and guest expectations, directly impacting service quality and cost efficiency (Barrett, 1995).

Relationship Between Digital Transformation and Facility Management

Digital transformation enhances FM by introducing tools that streamline operations and improve decision-making. IoT devices enable real-time monitoring of energy usage and equipment performance, while AI

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predicts maintenance needs, reducing downtime (Atta & Talamo, 2020). Cloud-based PMS centralises data management, improving coordination across departments. In hotels, these technologies enhance guest services through smart room controls and digital signage, while also promoting sustainability through energy-efficient systems (Kim & Shin, 2020). However, barriers such as cost, technical expertise, and organisational resistance can limit their adoption, particularly in resource-constrained settings like Nigeria (Oluwaseun et al., 2021).

Theoretical Framework

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a framework for understanding technology adoption in FM. TAM posits that perceived usefulness and perceived ease of use drive the intention to adopt technology, influencing attitudes and actual use (Ammenwerth, 2019). In this study, TAM evaluates how FM professionals in Abuja's hotels perceive digital tools' utility and usability, identifying barriers like perceived complexity or lack of training (Fedorko et al., 2018).

Empirical Review

Empirical studies highlight digital transformation's impact on FM in hospitality. Kim and Shin (2020) reported an 18% reduction in energy consumption in Korean hotels using IoT and BMS. Alrawadieh et al. (2021) found that cloud-based PMS reduced operational costs by 15% and improved data efficiency by 20%. In Nigeria, Awosode and Ajayi (2023) identified infrastructure and technical support as barriers to digital adoption. Guest-facing technologies have enhanced satisfaction by 30% in digitally advanced hotels (Das, 2023), underscoring the potential and challenges relevant to Abuja.

METHODS

This study adopted a quantitative research design, employing a survey method to collect data on digital transformation in FM practices in Abuja's hotels. This approach was chosen for its ability to provide measurable insights into technology adoption, influencing factors, and impacts (Creswell, 2014). The study targeted FM professionals and employees in hotels within Abuja Metropolis, Nigeria. A purposive sampling technique selected five hotels (Ibeto Hotel, Tranquil Mews Hotel, Grand Cubana Hotel, Behere Boutique Hotel, and Grand Pela Hotel) based on prominence and digital adoption levels. A total of 150 respondents were surveyed. Data were collected using a structured questionnaire with sections on demographics, FM characteristics, digital transformation extent, influencing factors, and impacts. A 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was used. The instrument's reliability was confirmed with a Cronbach's alpha of 0.82.

Data Presentation and Analysis

Descriptive statistics (means and standard deviations) assessed the extent and impacts of digital transformation. The Relative Importance Index (RII) ranked influencing factors, with values closer to 1 indicating higher importance. ANOVA tested for differences in digital transformation across hotels, and linear regression examined the relationship between digital transformation and FM practices. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

Results

Table 1: Descriptive Statistics on Digital Transformation in Facility Management

Hotel	Digital Tool/Aspect	Mean	Standard Deviation
Ibeto Hotel	Energy Management	4.15	0.62
	Guest Services	3.65	0.71

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	Real-time Communication	2.45	0.83
Behere Boutique	Cloud-based PMS	4.10	0.59
	IoT Devices	3.20	0.77
	Real-time Communication	2.40	0.85
Tranquil Mews	IoT Devices	2.69	0.91
	Energy Management	3.50	0.68
	Real-time Communication	2.50	0.79
Grand Cubana	IoT Devices	2.55	0.88
	Guest Services	3.40	0.74
	Real-time Communication	2.48	0.81
Grand Pela	Inventory Management	4.30	0.55
	Employee Satisfaction	4.26	0.60
	Real-time Communication	2.54	0.80

Source: Authors' field work 2025

Table 1 presents the descriptive statistics for digital transformation tools and aspects across selected hotels. Overall, digital tools related to energy management and inventory systems recorded the highest mean scores, suggesting greater levels of adoption and effectiveness in these areas. Specifically, Ibeto Hotel reported high utilisation of energy management systems (M = 4.15, SD = 0.62), while Grand Pela showed strong implementation of inventory management (M = 4.30, SD = 0.55) and employee satisfaction tools (M = 4.26, SD = 0.60). In contrast, real-time communication tools consistently exhibited the lowest mean values across all hotels, with means ranging from 2.40 to 2.54, indicating limited adoption or functional challenges in this aspect. For example, Behere Boutique (M = 2.40, SD = 0.85) and Grand Cubana (M = 2.48, SD = 0.81) both reflected relatively low usage of real-time communication technologies. IoT device integration varied significantly. While Behere Boutique showed moderate adoption (M = 3.20, SD = 0.77), both Tranquil Mews (M = 2.69, SD = 0.91) and Grand Cubana (M = 2.55, SD = 0.88) reflected lower engagement levels. Similarly, guest service technologies received moderate ratings, with Ibeto Hotel (M = 3.65, SD = 0.71) and Grand Cubana (M = 3.40, SD = 0.74) indicating somewhat consistent application. The observed standard deviations, particularly for real-time communication and IoT devices, suggest greater variability in implementation across the hotels, potentially due to infrastructural, financial, or managerial constraints.

Table 2: Extent of Digital Transformation (Objective 1)

Hotel	**Key Digital Tools**	**Mean Score**	**ANOVA Results**
Ibeto Hotel	Energy Management, Guest Services	3.90	F = 2.107, p = 0.132
Behere Boutique	Cloud-based PMS, IoT Devices	3.65	
Tranquil Mews	Energy Management, IoT Devices	3.10	
Grand Cubana	Guest Services, IoT Devices	2.98	

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Grand Pela	Inventory Management, Employee Satisfaction	4.28	

Source: Authors' Field work 2025

Table 2 summarises the mean scores for the extent of digital transformation across the selected hotels. Grand Pela reported the highest level of digital transformation (M = 4.28), reflecting strong adoption of inventory management and employee satisfaction systems. This was followed by Ibeto Hotel (M = 3.90), which demonstrated substantial engagement with energy management and guest service technologies. Behere Boutique showed moderate adoption (M = 3.65) of cloud-based PMS and IoT devices, while Tranquil Mews (M = 3.10) and Grand Cubana (M = 2.98) recorded comparatively lower mean scores, indicating less extensive integration of digital tools. The one-way ANOVA result (F = 2.107, p = .132) indicates that the differences in mean scores across the hotels were **not statistically significant** at the 0.05 level. This suggests that, although numerical variations exist in the extent of digital transformation, these differences are not large enough to conclude that any particular hotel has achieved a significantly greater level of digital transformation than the others in statistical terms.

Table 3: Factors Influencing Digital Transformation

Hotel	**Factor**	**RII**	**ANOVA Results**
Ibeto Hotel	Guest Expectations	0.86	F = 1.4243, p = 0.2414
	Technical Support	0.85	
Behere Boutique	Guest Expectations	0.83	
	Technical Support	0.82	
Tranquil Mews	Guest Expectations	0.87	
	Industry Trends	0.78	
Grand Cubana	Guest Expectations	0.93	
	Technical Support	0.91	
Grand Pela	Guest Expectations	0.89	
	Industry Trends	0.90	

Source: Authors' Field work 2025

Table 3 presents the relative importance index (RII) scores for the factors influencing digital transformation across the selected hotels. Guest expectations emerged as the most influential factor overall, with particularly high RII values for Grand Cubana (RII = 0.93) and Grand Pela (RII = 0.89). This trend indicates that customer demands for enhanced service quality, convenience, and personalisation strongly drive technological adoption in facility management. Technical support was also identified as a key determinant, especially in Grand Cubana (RII = 0.91) and Ibeto Hotel (RII = 0.85), highlighting the significance of adequate technical expertise, system maintenance, and troubleshooting capabilities in sustaining digital transformation initiatives. Industry trends exerted moderate influence, with notable scores in Grand Pela (RII = 0.90) and Tranquil Mews (RII = 0.78). This suggests that external pressures, competitive benchmarking, and sectoral innovations play a role, though to a lesser extent than direct customer expectations and internal technical capacity. The one-way ANOVA results (F = 1.4243, p = .2414) indicate no statistically significant differences in the influence of these factors across the hotels. This implies that, despite variation in RII values, the underlying drivers of digital transformation are relatively consistent within the sampled establishments.

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DISCUSSION

The findings of this study are closely aligned with existing scholarship on digital transformation and facility management within the hospitality sector. Consistent with the observations of Kim and Shin (2020), the results confirm that the integration of Internet of Things (IoT) technologies and Building Management Systems (BMS) can deliver significant energy savings, thereby enhancing operational efficiency whilst supporting environmental sustainability objectives. Similarly, the cost-saving benefits associated with the adoption of advanced digital systems mirror those reported by Alrawadieh et al. (2021), who highlighted the financial advantages of cloud-based Property Management Systems (PMS) in improving hotel performance.

Nevertheless, the relatively limited uptake of IoT in certain hotels reflects the infrastructural constraints identified by Awosode and Ajayi (2023) within the Nigerian context. These constraints are often attributable to irregular power supply, inadequate broadband connectivity, and the high costs associated with procuring and maintaining sophisticated technological infrastructure. Such challenges hinder both the implementation of innovative solutions and the realisation of their potential return on investment, thereby impeding the pace of digital transformation in facility management.

The results further indicate that guest expectations serve as a primary impetus for technology adoption. This finding corroborates Das's (2023) emphasis on the strategic importance of guest-facing innovations such as mobile check-in, smart room controls, and personalised service applications in sustaining competitiveness within the hospitality industry. As guests increasingly prioritise convenience, personalisation, and seamless service delivery, hotels are compelled to align their digital strategies with these evolving demands.

However, the study also revealed that weak communication systems remain a persistent operational barrier, a challenge similarly identified by Okumus et al. (2017) in their examination of the impediments to effective deployment of information technology projects in hotels. Inadequate interdepartmental communication, insufficient staff training, and the absence of integrated management systems can undermine the effectiveness of technological investments, even in cases where the requisite infrastructure is available.

From a theoretical perspective, these findings are congruent with the Technology Acceptance Model (TAM) proposed by Davis (1989) and further developed by Fedorko et al. (2018). TAM posits that perceived usefulness and perceived ease of use are central determinants of technology adoption. Within this context, guest-facing technologies are perceived as highly useful due to their tangible impact on customer satisfaction, whereas infrastructural deficiencies and communication inefficiencies diminish perceived ease of use, thereby constraining adoption rates.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Digital transformation significantly enhances FM practices in Abuja's hotels, with widespread adoption of foundational technologies like high-speed internet and energy-efficient systems. However, advanced tools such as IoT and real-time communication systems are unevenly implemented, with Ibeto and Behere Boutique hotels leading in digital maturity. Guest expectations, technical support, and industry trends are the primary drivers of adoption, while cost and ROI are secondary considerations. The strong positive correlation between digital transformation and FM efficiency (R^2 = 0.833–0.893) underscores its importance for operational performance and competitiveness. Addressing gaps in communication systems and ensuring uniform adoption across departments are critical for maximising benefits.

Recommendations

Invest in Advanced Digital Tools: Hotels should prioritise investments in IoT, AI, and cloud-based systems to enhance FM efficiency and guest satisfaction.

Develop Comprehensive Digital Strategies: Hotels must implement holistic strategies to standardise digital adoption across departments, addressing gaps in communication and housekeeping systems.

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Enhance Staff Training: Continuous training programmes should be introduced to improve employees' digital skills and reduce resistance to technology adoption.

Strengthen Technical Support: Hotels should ensure robust technical support and maintenance systems to sustain digital infrastructure reliability.

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