www.ijarp.com ISSN 2456-9992 Page: 01-17

International Journal Advanced Research Publications

Research Article

Volume: 02
Issue: 08

INFLUENCE OF SMART HOTEL TECHNOLOGIES ON GUEST SATISFACTION IN SELECTED 5-STAR HOTELS IN ABUJA, NIGERIA

Nnaji Chiamaka Jennifer*, Prof. Nasiru Idris, Lawal Mohammed

Ibrahim Usman Jibrin Institute for the Built Environment (IUJ-IBE), Nasarawa State University, Keffi, Nigeria.

Article Received: 13 July 2026, Article Revised: 02 August 2026, Published on: 22 August 2026

***Corresponding Author: Nnaji Chiamaka Jennifer**

Ibrahim Usman Jibrin Institute for the Built Environment (IUJ-IBE), Nasarawa State University, Keffi, Nigeria.

Doi: https://doi-doi.org/101555/ijarp.6924

ABSTRACT

The hospitality industry is undergoing rapid digital transformation, with smart technologies increasingly shaping guest experience and competitiveness in luxury hotel markets. This study examined the influence of smart hotel technologies on guest satisfaction in selected 5-star hotels in Abuja, Nigeria. A descriptive cross-sectional survey design was adopted, drawing 261 valid responses from a proportionate sample of 317 guests across six five-star hotels (82.3% response rate). Data were analysed using descriptive statistics, Pearson correlation and multiple linear regression, supported by Cronbach's alpha reliability testing ($\alpha = 0.869$). The findings revealed that smart hotel technologies were adopted to a high extent, with Mobile-Based Service Technologies recording the highest mean adoption score ($M = 3.656$, $SD = 0.534$), followed closely by Smart Security Systems, Artificial Intelligence Systems, Smart Room Technologies and Digital Communication Systems. Guest satisfaction was correspondingly high across all nine indicators measured ($M = 3.83–3.86$). Regression analysis showed that the five technology dimensions jointly explained 53.2% of the variance in guest satisfaction ($R^2 = 0.532$; $F(5,255) = 57.947$, $p < 0.001$). Smart Security Systems exerted the strongest independent influence ($\beta = 0.252$, $p < 0.001$), followed by Artificial Intelligence Systems ($\beta = 0.176$, $p = 0.010$), Digital Communication Systems ($\beta = 0.165$, $p = 0.029$) and Smart Room Technologies ($\beta = 0.146$, $p = 0.041$); Mobile-Based Service Technologies did not exert a statistically significant independent effect ($\beta = 0.093$, $p = 0.205$) once the other dimensions were controlled for. Perceived challenges to adoption, including connectivity and system-reliability concerns, were rated comparatively low. The findings

support the Technology Acceptance Model and the SERVQUAL framework, indicating that perceived usefulness, ease of use and service quality jointly drive guest satisfaction in technology-enabled hospitality settings. The study recommends prioritised investment in smart security and artificial intelligence systems, alongside sustained ICT infrastructure improvement, to strengthen guest satisfaction and competitive advantage in Nigeria's luxury hospitality sector.

KEYWORDS: Smart hotel technologies; Guest satisfaction; Technology acceptance; 5-star hotels; Hospitality digitalisation; Nigeria.

INTRODUCTION

The global hospitality industry has entered a phase of accelerated digital transformation, driven by advances in smart technologies, artificial intelligence and data-driven service systems. Hotels are increasingly transitioning from traditional service models to digitally enabled ecosystems in which technology shapes guest experience, operational efficiency and service personalisation (Buhalis et al., 2023; Ivanov & Webster, 2022). Smart hotel technologies typically include Internet of Things (IoT)-enabled room controls, mobile-based check-in and check-out systems, artificial intelligence chatbots, biometric security access, automated concierge services and personalised recommendation engines, designed to improve convenience and provide highly customised guest experiences across the customer journey (Park et al., 2022; Neuhofer et al., 2023).

In contemporary hospitality management, guest satisfaction is no longer determined solely by interpersonal service quality but increasingly by the seamless integration of digital and physical service environments. Guests in high-end hospitality settings expect frictionless, technology-enhanced experiences characterised by speed, personalisation, safety and autonomy in service interaction (Morosan & DeFranco, 2023), making smart technologies a critical determinant of perceived service quality and competitive advantage. While 5-star hotels in developed economies have largely embraced full-scale digital ecosystems, adoption in developing economies remains uneven due to infrastructural constraints, high implementation costs and varying levels of technological readiness (Etuk & Awah, 2024), a gap that is particularly evident in Africa's still-evolving hospitality digitalisation landscape.

In Nigeria, the hospitality sector, particularly in Abuja, has experienced significant growth driven by governmental activity, diplomatic presence, business travel and tourism demand, positioning the city's 5-star hotels as premium providers catering to high-income domestic

guests, expatriates, diplomats and international visitors. Despite this premium positioning, the extent to which these hotels have fully integrated smart technologies varies considerably: while some have adopted automated check-in kiosks, smart room controls and AI-enabled guest services, others still rely on partially manual processes. More importantly, there remains limited empirical evidence on whether the adoption of these technologies significantly translates into improved guest satisfaction within the Nigerian luxury hotel context.

Existing empirical studies on smart hospitality have concentrated disproportionately on developed economies, where digital infrastructure and user acceptance levels are considerably higher, leaving a contextual knowledge gap that limits the ability of hotel managers and policymakers to make informed digital-investment decisions in markets such as Nigeria. This study addresses that gap by examining the influence of smart hotel technologies on guest satisfaction in selected 5-star hotels in Abuja, Nigeria. Specifically, the study sought to (i) identify the smart hotel technologies adopted in the selected hotels, (ii) assess the level of guest satisfaction with these technologies, (iii) examine the influence of smart hotel technologies on guest satisfaction, (iv) identify the challenges affecting their adoption, and (v) propose strategies for improving smart technology implementation.

LITERATURE REVIEW

Smart Hotel Technologies and the Digital Transformation of Hospitality

Smart hotel technologies encompass mobile-based service platforms, smart room automation, artificial intelligence systems, smart security infrastructure and digital communication systems that collectively redefine the guest journey (Gretzel et al., 2015). Mobile-based service technologies, including reservation, check-in and payment applications, reduce queuing and administrative friction (Buhalis & Leung, 2022), while smart room technologies enable guests to personalise lighting, temperature and entertainment settings through IoT-enabled controls (Ivanov, Webster & Garenko, 2018). Artificial intelligence systems, such as chatbots and virtual concierge services, extend service availability beyond the limits of human staffing (Han et al., 2024), and smart security systems, including biometric access and surveillance analytics, respond directly to guests' safety expectations in premium hospitality settings (Chan & Lam, 2013). Digital communication systems integrate these functions, allowing guests to interact with hotel services through unified digital interfaces (Tanuja & Murugesan, 2024). Collectively, these dimensions constitute an interdependent technological ecosystem rather than isolated conveniences (Singh, Sharma & Bangad, 2024).

Guest Satisfaction in Technology-Enabled Hospitality

Guest satisfaction reflects the degree to which perceived hotel experience meets or exceeds expectation (Oliver, 2014), and in technology-enabled settings is expressed through service efficiency, convenience, comfort, responsiveness, perceived security, overall satisfaction, intention to revisit and willingness to recommend (Kotler, Bowen & Makens, 2017). Prior studies indicate that well-implemented smart technologies enhance these indicators by reducing service delays and increasing guests' sense of control over their stay (Baluyot, 2025), while poorly designed systems can generate frustration that offsets their functional benefits (Park et al., 2022). This duality underscores that adoption alone does not guarantee satisfaction; the perceived usefulness and usability of the technology, and the quality of the underlying service, are equally consequential.

Theoretical Framework

This study is anchored on the Technology Acceptance Model (TAM) and the SERVQUAL framework. TAM, developed by Davis (1989), posits that an individual's acceptance of a technology is primarily shaped by Perceived Usefulness and Perceived Ease of Use, which jointly influence attitude, behavioural intention and eventual satisfaction. Applied to hospitality, TAM suggests that guests adopt and value smart hotel technologies to the extent that these systems are perceived to save time, enhance comfort and be simple to operate; conversely, functionally beneficial systems that are complex or unreliable may still generate dissatisfaction. SERVQUAL, developed by Parasuraman, Zeithaml and Berry (1988), complements TAM by conceptualising service quality as the gap between guests' expectations and their perceptions of actual service performance across five dimensions — tangibles, reliability, responsiveness, assurance and empathy. In smart hotel contexts, technology functions as both a service delivery channel and a tangible cue of service quality, such that responsiveness delivered through digital systems and assurance conveyed through smart security infrastructure directly shape guests' quality perceptions. Read together, TAM explains why guests engage with smart technologies, while SERVQUAL explains how that engagement translates into satisfaction, providing a more complete account of the technology–satisfaction relationship than either framework alone.

Empirical Review and Research Gap

Empirical evidence broadly supports a positive relationship between smart hotel technologies and guest satisfaction. Yang et al. (2021) found that guests' acceptance of smart hotel

technology is significantly influenced by perceived usefulness and ease of use, while Han et al. (2024) reported that hotel guests' choice of smart products is driven by a combination of technology acceptance, technology readiness and emotional factors. Pizam et al. (2024) demonstrated that perceived risk and information security materially shape guests' acceptance of technology-driven hotel services, and Chan and Lam (2013) similarly highlighted the centrality of safety and security perceptions to guest confidence in hotel technology. However, the majority of this evidence originates from developed economies with advanced digital infrastructure, high internet penetration and stable electricity supply, conditions that differ markedly from those in developing countries such as Nigeria. Within Nigeria, studies have tended to examine hospitality technology adoption in general operational or e-commerce terms (Etuk & Awah, 2024) or in non-luxury hotel segments (Ojukwu et al., 2026), with comparatively little empirical attention paid to the joint influence of multiple technology dimensions, mobile-based, smart room, artificial intelligence, smart security and digital communication systems, on guest satisfaction within 5-star hotels specifically. This study addresses that gap by empirically examining these five dimensions jointly, using TAM and SERVQUAL as a combined analytical lens, within the premium hospitality market of Abuja, Nigeria.

METHODOLOGY

This study adopted a descriptive cross-sectional survey design, appropriate for capturing guests' perceptions and experiences of smart hotel technologies at a single point in time without manipulating the study environment (Saunders, Lewis & Thornhill, 2023). The study was conducted in Abuja, the Federal Capital Territory of Nigeria, which hosts one of the country's largest concentrations of internationally rated hotels and a guest population, comprising diplomats, government officials, expatriates and business travellers, well positioned to evaluate technology-enabled luxury service. Six purposively selected five-star hotels formed the study population: Transcorp Hilton Abuja, Abuja Continental Hotel, Wells Carlton Hotel and Apartments, Envoy Hotel, Johnwood Hotel by Bolton and Summerset Continental Hotel. These hotels were selected because they are classified as five-star establishments, are located within Abuja, have implemented smart hotel technologies and attract substantial volumes of business and leisure travellers.

A sample of 317 guests was drawn using the Taro Yamane formula at a 5% margin of error and proportionately allocated across the six hotels in line with their estimated guest population (Table 1), after which respondents were selected via convenience sampling at

hotel reception areas, business centres, restaurants and executive lounges. Respondents were eligible for inclusion if they were at least 18 years of age, had stayed at least one night and had personally used one or more smart hotel technologies during their stay.

Table 1. Proportional Distribution of the Sample Among Selected Hotels.

Hotel	Estimated Guest Population	Sample Allocation
Transcorp Hilton Abuja	667	139
Abuja Continental Hotel	540	114
Johnwood Hotel by Bolton	124	25
Wells Carlton Hotel and Apartments	69	13
Envoy Hotel	59	13
Summerset Continental Hotel	58	13
Total	1,517	317

Source: Field Survey (2026).

Primary data were collected using a structured questionnaire comprising a socio-demographic section and Likert-scaled items measuring the five smart hotel technology dimensions, nine guest satisfaction indicators, eight potential adoption challenges and eight improvement strategies. The instrument's internal consistency was confirmed through Cronbach's alpha ($\alpha = 0.869$ across seven core items), exceeding the 0.70 threshold and indicating good reliability. Data were analysed in SPSS Version 26 using descriptive statistics (frequencies, percentages, means and standard deviations), Pearson Product-Moment Correlation to establish the direction and strength of association between the technology dimensions and guest satisfaction, and multiple linear regression to determine each dimension's unique predictive contribution to guest satisfaction while controlling for the others. A criterion mean of 3.00 (five-point items) or 2.50 (four-point items) was used as the decision benchmark for agreement, and statistical significance was evaluated at the 0.05 level.

RESULTS AND DISCUSSION

Response Rate and Respondent Profile

Of the 317 questionnaires administered, 261 were returned complete and usable, yielding a response rate of 82.3%. Respondents were almost evenly split by gender (50.6% male, 49.4% female) and fairly distributed across age brackets, with the 26–35 years group the largest (22.6%). The majority (76.2%) held post-secondary qualifications, and 78.5% were Nigerian nationals, with the remainder drawn from other countries, reflecting Abuja's cosmopolitan

guest base. Respondents' purpose of stay was fairly evenly distributed across business, leisure, official assignment and conference/event travel, with conference and event attendees the single largest group (27.2%). This demographic spread suggests a sample well positioned to provide informed, experience-based assessments of hotel technology, with minimal risk of the findings being skewed by any single guest segment.

Correlation Among Study Variables

Table 2. Pearson Correlation Matrix of the Study Variables.

Variable	GSAT	Mobile	Smart Room	AI Systems	Security	Digital Comm.
Guest Satisfaction (GSAT)	1.000	0.618**	0.628**	0.627**	0.658**	0.643**
Mobile-Based Service Tech.	0.618**	1.000	0.703**	0.705**	0.699**	0.740**
Smart Room Technologies	0.628**	0.703**	1.000	0.677**	0.699**	0.733**
Artificial Intelligence Systems	0.627**	0.705**	0.677**	1.000	0.686**	0.689**
Smart Security Systems	0.658**	0.699**	0.699**	0.686**	1.000	0.714**
Digital Communication Systems	0.643**	0.740**	0.733**	0.689**	0.714**	1.000

*Source: Field Survey (2026). **Correlation is significant at the 0.01 level (2-tailed).*

All five technology dimensions correlated positively and significantly with guest satisfaction ($r = 0.618–0.658$, $p < 0.01$), with Smart Security Systems showing the strongest bivariate association. The independent variables were also strongly intercorrelated ($r = 0.677–0.740$), consistent with hotels tending to adopt smart technologies as a bundled ecosystem rather than piecemeal, a pattern consistent with the integrated-ecosystem view of Singh, Sharma and Bangad (2024). Because none of the intercorrelations exceeded 0.80, multicollinearity was not judged to be a serious threat to the subsequent regression analysis, a conclusion later confirmed by the collinearity diagnostics reported in Table 6. Correlation, however, only establishes association; regression was therefore used to isolate each dimension's independent predictive contribution.

Adoption of Smart Hotel Technologies

All five technology dimensions recorded mean scores above the high-adoption benchmark of 3.50 (Table 3, Figure 1), indicating that the selected 5-star hotels have adopted smart technologies broadly and consistently rather than selectively. Mobile-Based Service Technologies recorded the highest adoption (M = 3.656, SD = 0.534), narrowly ahead of Smart Security Systems (M = 3.645), Artificial Intelligence Systems (M = 3.644), Smart Room Technologies (M = 3.639) and Digital Communication Systems (M = 3.628). The narrow spread between the highest- and lowest-ranked dimensions (0.028 points) suggests that, unlike markets where technology adoption is uneven across categories, these hotels have pursued a fairly balanced digital transformation strategy across guest-facing touchpoints.

Table 3. Descriptive Statistics of Smart Hotel Technology Dimensions. (N = 261)

Technology Dimension	Mean	SD	Min–Max	Rank
Mobile-Based Service Technologies	3.656	0.534	2.00–5.00	1st
Smart Security Systems	3.645	0.491	2.00–5.00	2nd
Artificial Intelligence Systems	3.644	0.492	2.20–5.00	3rd
Smart Room Technologies	3.639	0.506	2.20–5.00	4th
Digital Communication Systems	3.628	0.508	2.20–5.00	5th

Source: Field Survey (2026).

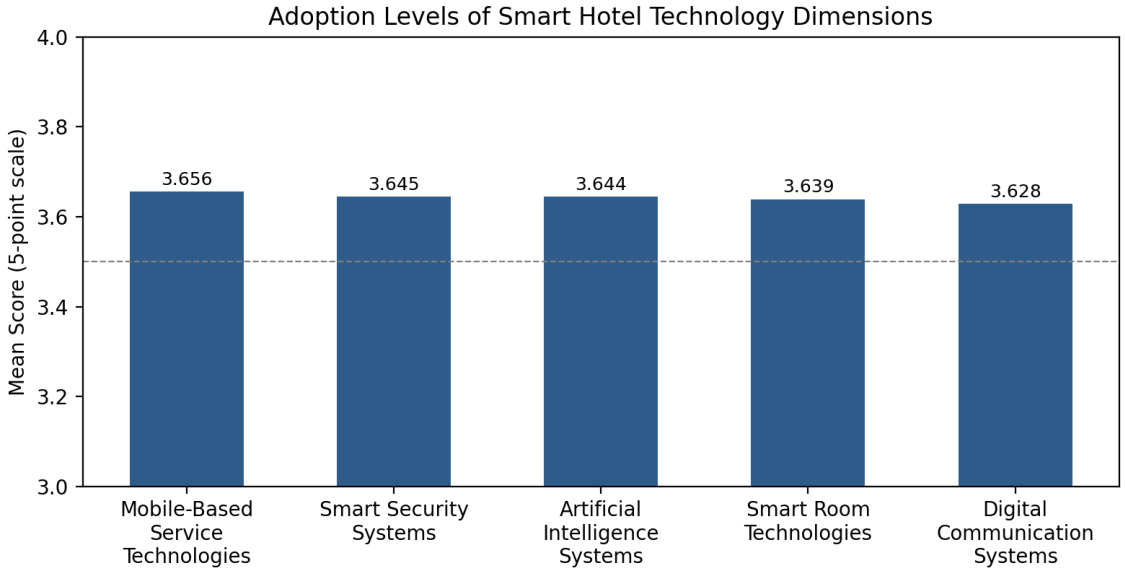

Figure 1. Adoption Levels of Smart Hotel Technology Dimensions.

This high, evenly distributed adoption pattern corroborates Yang et al. (2021), who found that guests' acceptance of smart hotel technology is closely tied to perceived usefulness and ease of use, and Singh, Sharma and Bangad (2024), who documented the rise of smart hotels as an integrated technology-driven business model rather than a set of discrete gadgets. Read through TAM, the leading position of Mobile-Based Service Technologies is intuitive: reservation, check-in and payment applications directly reduce transactional friction and are typically the simplest smart systems for guests to operate, making them the easiest entry point for both hotels and guests into digital service delivery. The comparatively lower, though still high, ranking of Digital Communication Systems suggests these integrative platforms may still be maturing relative to their single-function counterparts, an interpretation consistent with the research-gap literature noting that most prior studies examine individual technologies in isolation rather than the integrated ecosystems now emerging in premium African hospitality markets (Ogunbiyi, Oladapo & Goulding, 2022, on the broader Nigerian sustainable-technology adoption pattern).

Level of Guest Satisfaction

Table 4. Descriptive Statistics of Guest Satisfaction Indicators. (N = 261)

Satisfaction Indicator	Mean	SD	Min–Max	Rank
Hotel staff respond quickly through digital systems	3.86	0.452	3–5	1st
Overall, I am satisfied with the hotel experience	3.85	0.464	3–5	2nd
I intend to revisit this hotel in the future	3.85	0.466	3–5	2nd
Smart technologies improve speed of service delivery	3.84	0.444	3–5	4th
Smart systems make hotel services more convenient	3.84	0.447	3–5	4th
Smart technologies improve my feeling of safety	3.84	0.483	3–5	4th
Smart hotel technologies meet my expectations	3.84	0.432	3–5	4th
I will recommend this hotel to others	3.84	0.453	3–5	4th
Smart technologies improve my comfort during stay	3.83	0.475	3–5	9th

Source: Field Survey (2026).

All nine satisfaction indicators recorded mean scores above 3.50 (Table 4), and the tight clustering of means (3.83–3.86) with low standard deviations points to a consistently positive, rather than polarised, guest evaluation of smart technologies. The highest-rated item, staff responsiveness through digital systems, aligns with SERVQUAL's responsiveness dimension and suggests that guests value technology most where it visibly accelerates staff–

guest interaction rather than replacing it. That comfort during the stay was the lowest-ranked, though still high, item is a useful nuance: it suggests smart technologies are perceived primarily as service-efficiency and convenience enablers, with comfort gains a secondary, indirect benefit. This pattern is consistent with Han et al. (2024), who found guests' preference for smart hotel products to be driven more by perceived usefulness of the technology than by ambient comfort per se, and with the SERVQUAL premise that satisfaction depends on service performance meeting expectations across multiple, not single, quality dimensions.

Influence of Smart Hotel Technologies on Guest Satisfaction

Table 5. Regression Model Summary.

Model	R	R^2 / Adj. R^2	Std. Error	Durbin–Watson
1	0.729	0.532 / 0.523	0.251	2.020

Source: Field Survey (2026). Predictors: Mobile-Based Service, Smart Room, AI, Smart Security, Digital Communication; Dependent: Guest Satisfaction.

Table 6. ANOVA for the Regression Model.

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.261	5	3.652	57.947	0.000
Residual	16.072	255	0.063	–	–
Total	34.333	260	–	–	–

Source: Field Survey (2026).

Table 7. Standardised Regression Coefficients for the Influence of Smart Hotel Technologies on Guest Satisfaction.

Predictor	B	β	t	Sig.	VIF
Mobile-Based Service Technologies	0.063	0.093	1.271	0.205	2.907
Smart Room Technologies	0.105	0.146	2.050	0.041*	2.763
Artificial Intelligence Systems	0.130	0.176	2.582	0.010*	2.540
Smart Security Systems	0.187	0.252	3.598	0.000*	2.680
Digital Communication Systems	0.118	0.165	2.200	0.029*	3.070

*Source: Field Survey (2026). *Significant at $p < 0.05$. Constant = 1.649 ($t = 12.649$, $p < 0.001$). Tolerance values ranged from 0.326–0.394; all VIF < 5, indicating no serious multicollinearity.*

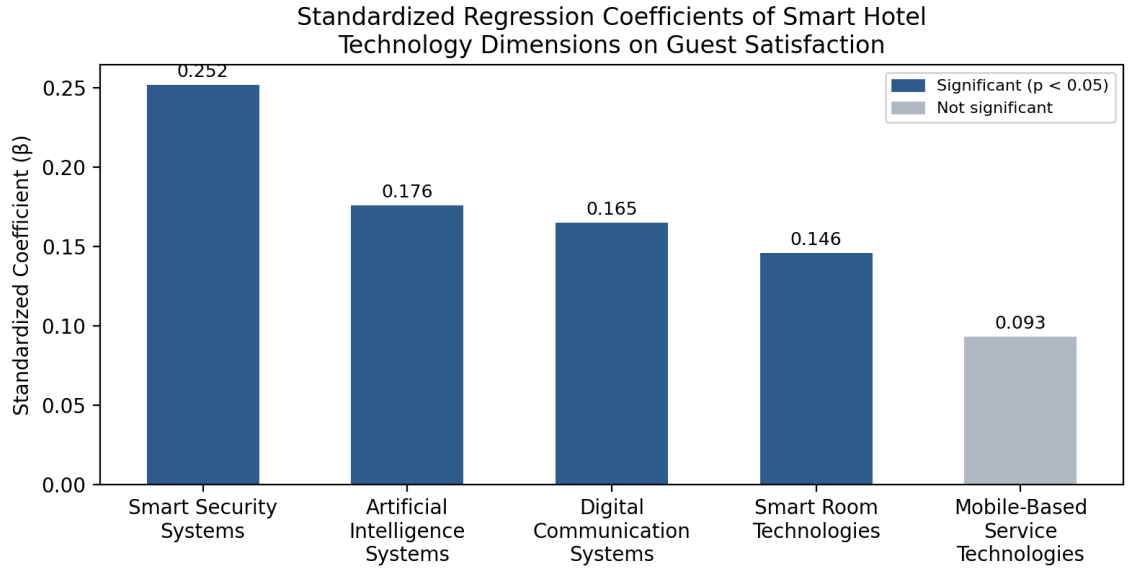

Figure 2. Standardised Regression Coefficients of Smart Hotel Technology Dimensions on Guest Satisfaction.

The five technology dimensions jointly explained 53.2% of the variance in guest satisfaction ($R^2 = 0.532$; Adj. $R^2 = 0.523$), and the overall model was highly significant ($F(5,255) = 57.947$, $p < 0.001$), confirming that smart hotel technologies are a substantial, though not exclusive, determinant of guest satisfaction; the remaining 46.8% of variance is attributable to factors outside the model, such as staff interpersonal service, pricing and physical facilities. At the individual-predictor level, Smart Security Systems exerted the strongest unique influence ($\beta = 0.252$, $p < 0.001$), followed by Artificial Intelligence Systems ($\beta = 0.176$, $p = 0.010$), Digital Communication Systems ($\beta = 0.165$, $p = 0.029$) and Smart Room Technologies ($\beta = 0.146$, $p = 0.041$). Mobile-Based Service Technologies, despite recording the highest adoption mean and a strong bivariate correlation with satisfaction ($r = 0.618$), did not retain a statistically significant independent effect once the other four dimensions were controlled for ($\beta = 0.093$, $p = 0.205$).

This last result is analytically important and merits closer interpretation than a purely descriptive reading would offer. The gap between a strong zero-order correlation and a non-significant standardised coefficient is a classic signature of shared variance: mobile-based systems are highly intercorrelated with the other four dimensions ($r = 0.699$–0.740, Table 2), meaning their apparent influence on satisfaction is substantially absorbed by security, AI and communication systems once these are entered jointly. Substantively, this suggests mobile reservation and payment platforms function as a necessary but not sufficient condition for guest satisfaction, an accessibility layer that gets guests into the digital ecosystem, while the

systems that guests actually associate with differentiated value- security, intelligent service and integrated communication- carry the predictive weight. This nuances the adoption findings in Table 3, where Mobile-Based Service Technologies ranked first: high adoption does not automatically translate into the largest independent satisfaction gain, a distinction that a purely descriptive analysis would have missed.

The primacy of Smart Security Systems is consistent with SERVQUAL's assurance dimension, which links guests' confidence in a service provider's competence and trustworthiness directly to satisfaction. It corroborates Chan and Lam (2013), who found that security perceptions materially shape guests' confidence in hotel technology, as well as Pizam et al. (2024), who reported that perceived risk and information security significantly influence guests' acceptance of technology-driven hotel services. That Artificial Intelligence Systems ranked second supports Han et al. (2024), who linked guests' choice of smart hotel products to technology-acceptance and technology-readiness factors operating jointly, consistent with TAM's emphasis on perceived usefulness. Taken together, the regression results indicate that in the Abuja luxury hotel market, guest satisfaction is driven less by the breadth of technology adoption and more by the perceived reliability, security and intelligence of the systems guests actually use, a finding with direct implications for how hotel managers should prioritise digital investment (see Practical Implications).

Challenges Affecting Smart Hotel Technology Adoption

Table 8. Descriptive Statistics of Perceived Challenges. (N = 261)

Challenge	Mean	SD	Rank
Some smart systems are unreliable during peak periods	2.30	0.514	1st
Privacy and cybersecurity concerns affect guest confidence	2.28	0.515	2nd
Frequent system failures reduce service quality	2.28	0.514	2nd
Power supply problems affect digital hotel systems	2.27	0.532	3rd
Inadequate staff training affects technology performance	2.26	0.518	4th
Some guests find smart technologies difficult to use	2.25	0.520	6th
High maintenance cost affects technology sustainability	2.25	0.513	6th
Poor internet connectivity affects smart hotel services	2.23	0.529	8th

Source: Field Survey (2026).

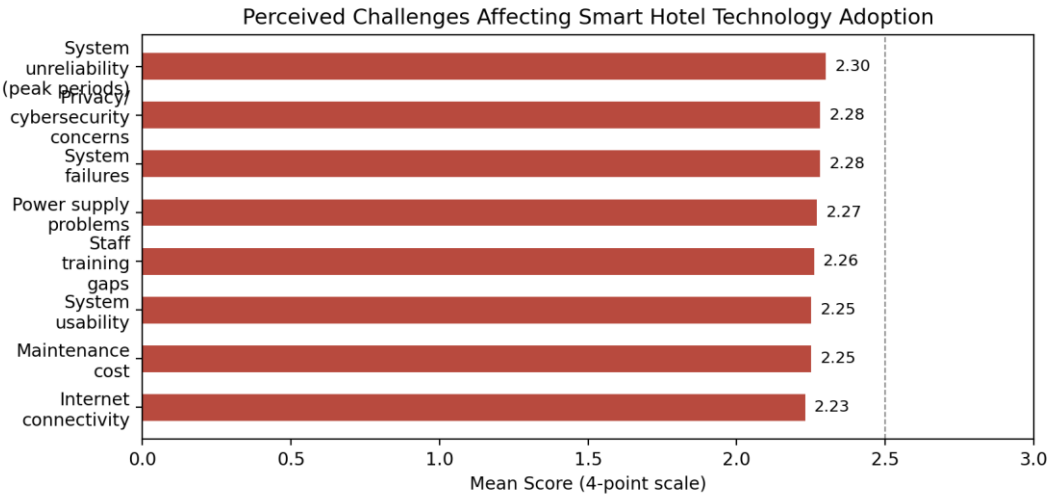

Figure 3. Perceived Challenges Affecting Smart Hotel Technology Adoption.

All eight challenge items fell below the 2.50 disagreement benchmark (M = 2.23–2.30), indicating that respondents did not, on balance, regard these factors as major barriers within the selected hotels. This finding departs from Pizam et al. (2024) and Chan and Lam (2013), both of whom identified security and risk perceptions as significant barriers to technology acceptance in hotel settings, and instead suggests that the six hotels sampled have reached a level of technological and managerial maturity, in infrastructure, staff competence and system maintenance, sufficient to keep these barriers below the threshold at which they would meaningfully depress adoption or satisfaction. This interpretation is reinforced by the earlier finding that perceived challenges showed no significant correlation with guest satisfaction ($r = -0.046$, $p > 0.05$, Table 2). It should, however, be read as evidence of effective barrier management within this specific, premium hotel segment rather than as a general claim about the Nigerian hospitality sector, where infrastructural constraints such as unreliable electricity and internet connectivity remain well documented (Ogunbiyi, Oladapo & Goulding, 2022; Akinyemi, Aigbavboa & Oke, 2021).

Strategies for Improving Smart Hotel Technology Implementation

Respondents strongly endorsed all eight proposed improvement strategies (M = 3.95–3.98 on a five-point scale), with improving internet connectivity and ICT infrastructure and carrying out regular maintenance on smart systems rated highest, and designing more user-friendly systems and pursuing continuous technology upgrades rated marginally lower, though still strongly endorsed. This consensus indicates that guests view sustained infrastructure investment and system upkeep, rather than the introduction of entirely new technologies, as

the most immediate priority, a view consistent with the challenge findings above: guests are less concerned about whether smart systems exist than about whether existing systems remain consistently reliable during peak demand. This is consistent with Yang et al. (2021), who found that improving the functionality and usability of smart hotel technologies enhances guest acceptance and overall experience, and reinforces TAM's proposition that continuous improvement in perceived usefulness and ease of use sustains, rather than merely initiates, technology acceptance.

CONCLUSION

This study examined the influence of smart hotel technologies on guest satisfaction in selected 5-star hotels in Abuja, Nigeria, using a descriptive cross-sectional survey of 261 guests. The findings establish that smart hotel technologies have been adopted to a high and fairly balanced extent across the five dimensions studied, and that guests report correspondingly high satisfaction with these technologies. Regression analysis confirmed that smart hotel technologies collectively exert a significant, moderately strong influence on guest satisfaction, explaining just over half of its variance, with Smart Security Systems, Artificial Intelligence Systems, Digital Communication Systems and Smart Room Technologies each making significant independent contributions, while Mobile-Based Service Technologies, despite the highest adoption level, did not retain a significant independent effect once shared variance with the other dimensions was accounted for. Perceived challenges to adoption were comparatively low, suggesting that the selected hotels have managed the infrastructural and organisational barriers that typically constrain smart hospitality adoption in developing-country settings. Overall, the findings support the combined explanatory value of the Technology Acceptance Model and SERVQUAL: guests accept and value smart hotel technologies to the extent that these systems are useful, easy to use and capable of narrowing the gap between service expectation and service performance, particularly around security, intelligence and responsiveness.

PRACTICAL IMPLICATIONS

For hotel managers, the finding that Smart Security Systems and Artificial Intelligence Systems carry the greatest independent weight in shaping guest satisfaction suggests that digital investment should be prioritised and sequenced accordingly, rather than spread evenly across all technology categories. Where budgets are constrained, upgrading biometric access, surveillance analytics and AI-enabled concierge or chatbot services is likely to yield a larger

satisfaction return than incremental additions to mobile reservation functionality, which guests already experience as adequately mature. At the same time, because mobile-based systems remain the primary access point through which guests enter the digital ecosystem, they should be maintained rather than deprioritised; the finding is about relative marginal contribution, not about the value of mobile systems in absolute terms.

For hotel owners and investors, the consistently low ratings attached to adoption challenges, alongside strong guest endorsement of continued investment in ICT infrastructure and system maintenance, indicate that the return on further digital investment in this market segment is unlikely to be constrained by guest resistance or basic infrastructural failure, but rather by the reliability of systems under peak demand. This points to system redundancy, preventive maintenance schedules and service-level monitoring as practical near-term priorities. For policymakers and tourism authorities, the study's evidence that a developing-country luxury hotel segment can achieve high-reliability smart technology adoption offers a benchmark for shaping digital-infrastructure incentives and standards applicable to the wider Nigerian hospitality sector.

REFERENCES

1. Akinyemi, B. A., Aigbavboa, C., & Oke, A. (2021). Sustainable construction practices in Nigeria: Awareness, implementation and barriers. International Journal of Construction Management, 21(8), 789–803.
2. Baluyot, M. B. B. (2025). Technological transformation in hospitality: Impact of IoT-enabled services on hotel guest satisfaction. Journal of Information Systems Engineering and Management, 10(43s), 1–15.
3. Buhalis, D., & Leung, R. (2022). Smart hospitality ecosystems and digital transformation in tourism. International Journal of Contemporary Hospitality Management, 34(5), 1800–1818.
4. Buhalis, D., Leung, R., & Lin, M. (2023). Smart hospitality and digital transformation in tourism and hospitality. International Journal of Contemporary Hospitality Management, 35(8), 2890–2912.
5. Chan, E. S. W., & Lam, D. (2013). Hotel safety and security systems: Bridging the gap between managers and guests. International Journal of Hospitality Management, 32, 202–216.
6. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340.

7. Etuk, A. J., & Awah, A. E. (2024). Technological service innovation and customer satisfaction in hotels in developing economies. International Journal of Interdisciplinary Research in Marketing and Management, 9(1), 45–60.
8. Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. Electronic Markets, 25(3), 179–188.
9. Han, H., Kim, S., Badu-Baiden, F., Al-Ansi, A., & Kim, J. J. (2024). Drivers of hotel guests' choice of smart products: Applying a complexity theory involving TAM, technology readiness, TPB, and emotion factors. International Journal of Hospitality Management, 120, 103755.
10. Ivanov, S., & Webster, C. (2022). Digital transformation in tourism and hospitality. Springer.
11. Ivanov, S., Webster, C., & Garenko, A. (2018). Young Russian adults' attitudes towards the potential use of robots in hotels. Technology in Society, 55, 24–32.
12. Kotler, P., Bowen, J. T., & Makens, J. C. (2017). Marketing for hospitality and tourism (7th ed.). Pearson.
13. Morosan, C., & DeFranco, A. (2023). Hotel guests' acceptance of technology-enabled services. International Journal of Contemporary Hospitality Management, 35(3), 946–974.
14. Neuhofer, B., Buhalis, D., & Ladkin, A. (2023). Smart technologies and co-created guest experiences in hospitality. Tourism Review, 78(2), 350–367.
15. Ogunbiyi, O., Oladapo, A., & Goulding, J. (2022). Barriers to sustainable construction in Nigeria: Evidence from construction professionals. International Journal of Construction Management, 22(11), 2147–2160.
16. Ojukwu, H. S., Bosah, G. N., Owuamanam, C. Y., & Okeke, N. R. (2026). Emerging digital disruptions and guests' satisfaction in Nigeria's franchised hotels: Evidence from Awka Metropolis, Anambra State, Nigeria. ABUAD Journal of Social and Management Sciences, 7(1).
17. Oliver, R. L. (2014). Satisfaction: A behavioral perspective on the consumer (2nd ed.). Routledge.
18. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12–40.

19. Park, H., Lee, M., Back, K. J., & DeFranco, A. (2022). Is hotel technology a double-edged sword on customer experience? Journal of Hospitality Marketing & Management, 31(5), 881–894.
20. Pizam, A., Ozturk, A. B., Hacikara, A., Zhang, T., Balderas-Cejudo, A., Buhalis, D., Fuchs, G., Hara, T., Meira, J. V. S., Revilla, R. G. M., Sethi, D., Shen, Y., & State, O. (2024). The role of perceived risk and information security on customers' acceptance of service robots in the hotel industry. International Journal of Hospitality Management, 117, 103641.
21. Saunders, M., Lewis, P., & Thornhill, A. (2023). Research methods for business students (9th ed.). Pearson.
22. Singh, S., Sharma, M., & Bangad, P. R. (2024). Technology-driven trends in hospitality: The rise of smart hotels in the digital era. ShodhKosh: Journal of Visual and Performing Arts, 5(6).
23. Tanuja, M., & Murugesan, S. (2024). Smart hospitality: Integrating IoT for guest satisfaction and efficiency. International Journal of Robotics and Mechatronics, 11(1), 22–38.
24. Yang, H., Song, H., Cheung, C., & Guan, J. (2021). How to enhance hotel guests' acceptance and experience of smart hotel technology: An examination of visiting intentions. International Journal of Hospitality Management, 97, 103000.