**Effectiveness of ICT Integration for Hotel**

**Performance in Lagos, Nigeria.**

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**Abstract**

*The integration of ICT technologies in hotel operations presents unique opportunity that can drive transformative changes. However, its integration remains limited in Nigeria. This study therefore investigated the effectiveness of ICT integration on performance of hotels in Lagos. Specifically, the study finds out the specific ICT tools used by hotels in Lagos, level of effectiveness of the ICT integrated ICT tools for hotel performance, the effect of ICT integration on operational efficiency and customer satisfaction and the challenges to the effectiveness of ICT integration by hotels in Lagos. The study was quantitative survey research using a total of 400 participants from guests in selected hotels in Lagos. A well-structured questionnaire was used to collect data for the study. Findings revealed that the major ICT applications were for reservations and in-room technology, while others like customer relationship management and mobile technology are less prevalent. It was also revealed that while the availability of ICT technologies only does imply operational efficiency, the effectiveness of ICT technologies significantly impacts both operational efficiency and customer satisfaction. The major challenges that attributed to poor efficiency in integration of ICT in the hotels were low technical skills, high cost of technology, security concerns, unfavorable policies, and cultural/individual differences. This therefore calls for stakeholders to invest in skill development, advocate for enhanced security measures, and promote favorable policies conducive to technological innovation within the hospitality industry.*

**Keywords:** ICT Integration, Hotel Performance, Customer Satisfaction, ICT Tools

**Introduction**

In the light of every increasing use of information and communication technology (ICT), the integration of ICT is becoming increasingly prevalent in the hospitality industry, with hotels leveraging various technological tools and systems to enhance operations and improve guest experiences (Ezzaouia & Jacques, 2022). The applications of ICT in hotel services have a wide range of applications which includes customer relations software, Wi-Fi provision, security systems, in-room technology, etc. (Schmidgall & DeFranco, 2015).

One of the primary objectives of integrating ICT in hotels is to enhance guest satisfaction by providing personalized experiences and seamless interactions throughout the guest journey. For instance, guests can easily make use of mobile apps to make reservations, check-in/out, access digital room keys, and communicate with hotel staff conveniently just from their smartphones (Law et al., 2018). Similarly, in-room technology such as smart TVs and voice-controlled assistants offer added convenience and entertainment options for guests (Ramaraj, 2013; Onyeonoro et al., 2023). Furthermore, ICT integration could enable hotels to optimize revenue management strategies by analyzing data on booking patterns, guest preferences, and market trends (Millauer & Vellekoop, 2019).

In many parts of the world, and in most developed nations where ICT technologies have been largely integrated into hotel services delivery and management, the hospitality industry has experienced transformative changes in efficiency, guest experiences, and overall competitiveness (Ezzaouia & Jacques, 2022). Similarly, in developing countries like Nigeria, the integration of ICT technologies in hotel operations presents a unique opportunity to drive similar transformative changes. However, there is evidence of poor integration of ICT resources in hotel operations (Onyeonoro et al., 2023; Oke, 2023). The aim of this paper is to examine the effectiveness of ICT Integration for Hotel Performance in Lagos, Nigeria. Specifically, this study highlights the specific ICT tools used by hotels in Lagos, find out the level of effectiveness of the ICT integrated ICT tools are for hotel performance, examine the effect of ICT integration on hotel performance and customer satisfaction, and investigate the challenges to the effectiveness of ICT integration by hotels in Lagos.

**ICT Integration**

Information and Communication Technology (ICT) is a broad range of technologies and tools used to manage, store, transmit, and exchange information electronically. ICT includes various hardware, software, networks, and services that enable individuals and organizations to access, process, and communicate data and information efficiently. These include but are not limited to computers, smartphones, the internet, telecommunications networks, software applications, databases, and other digital platforms and tools (Jo, 2013).

The integration of Information and Communication technologies is taking the front role in enhancing service delivery of almost every sector. ICT integration simply means the incorporation and utilization of various technological tools and systems such as computers, software applications, internet services, digital devices, and communication networks to enhance and support teaching, learning, and organizational processe to enhance operations and services. Pranicevic and Mandic (2020) highlighted that ICT integration in hotel performance includes: marketing, information provision (Hur et al., 2017; Li et al., 2016), management and service co-creation (Martin & Roman, 2017; Sarmah et al., 2017). Similarly, some key areas of ICT integration in hotels include reservation systems (Ned & Lameck, 2019), property management systems (Alaa. & Pratt, 2022), customer relationship management (Sigala, 2003), in-room technology (Stringam & Gerdes, 2021), wireless connectivity (Narraidoo, 2011), development of mobile applications (Law et al., 2018), electronic payment systems (Onyeonoro et al., 2023), security system (Ramaraj, 2013) and energy management system (Nwokorie & Igbojekwe, 2019). In this paper, the term ICT integration will provide light on the impact of availability and effectiveness of the highlighted ICT technologies on hotel performance.

**Hotel Performance: Operational Efficiency, Service Delivery and Customer Satisfaction**

The term hotel performance has been explored by quite a number of researchers and different constructs have been developed to measure hotel performance. Hotel performance simply refers to the measurement and evaluations of key indicators to assess the effectiveness, efficiency and profitability of a hotel's operations. It involves analyzing multiple aspects of a hotel's performance to gauge its overall success and competitiveness within the hospitality industry (Sainaghi, 2014; Mitrovic et al., 2016). Hotel performance can be measured using financial key indicators or non-financial indicators. Some of the key financial metrics include average daily rate, revenue per available room, total revenue, net operating income, etc. Other metrics include occupancy rates, guest satisfaction, operational efficiency, employee satisfaction, and brand reputation (Wuambua, 2014). The major constructs used for hotel performance in this paper are operational efficiency and customer satisfaction.

Operational efficiency refers to the capacity to provide goods and services in a cost-efficient manner while maintaining high quality standards (Johnson & Lee, 2012). In depicting hotel performance, operational efficiency plays a pivotal role as it directly impacts the hotel's ability to deliver excellent guest experiences while managing costs effectively (Poldrugovac et al., 2016). The enhancement of service delivery remains crucial to the successful operation of any hotel (Lodorfos et al., 201; Lee et al., 2021). It involves delivering hospitality services to guests throughout their hotel stay, involving the interactions and experiences they encounter with hotel personnel, facilities, and amenities from their time of arrival to departure. Improved service delivery no doubt often results in customer satisfaction (Möhlmann, 2015). Customer satisfaction remains a very important parameter to tell the extent of organizational performance. In the case of hotel services, having a satisfied customer depicts that the hotel services please the customer. Although this can be highly subjective, it is still considered an important performance indicator.

**Empirical Review**

Quite a few studies have explored the arenas of ICT integration in enhancing hotel performance. Sirirak et al., (2011) investigated if the integration of ICT significantly influences hotel performance. In conceptualizing ICT adoption, the study used availability of ICT components, integration, and intensity of use while for hotel performance, the study used operational productivity and customer satisfaction. The study found that ICT adoption has a significant positive relationship with operational productivity while the intensity of ICT usage has a significant relationship with both operational productivity and customer satisfaction. Using a quantitative approach, Ezzaouia and Jacques (2022) investigated the impact of IT adoption on hotel performance in Morocco. For hotel performance, the study used two main constructs which are employee performance and financial performance. It was revealed in the study that there exists a significant relationship between IT adoption and employee performance and a positive relationship between IT adoption and financial performance of hotels.

Onyeonoro et al. (2023) examined the effect of e-payment system on hotel performance in Abia State using the survey research design. In conceptualizing hotel performance, the study made use of customer patronage and sales volume. The study findings revealed that Automated Teller Machine (ATM), Point of Sales (POS) and mobile banking system used by hotels have significant influence on hotel performance in form of customer patronage and sales volume and also improved their global presence. Dominici and Guzzo (2010) investigated customer satisfaction in the hotel industry by knowing guests’ opinion through a mixed method (survey and interview). Both hotel managers and guests were surveyed and interviewed. The study discovered that despite the importance of customer satisfaction as an indicator of good hotel performance using ICT, there is still a lot to be done for better positive influence.

Oke (2023) examined ICT usage and tourism destination patronage in Nigeria using a survey method. The data was collected using an online questionnaire. It was discovered that ICT usage could have an effect on tourism destination patronage, and it is very important to tourism and the development of the hospitality industry. Richard (2023) explored the role of ICT in the hospitality industry in Cape Town, South Africa. The research employed quantitative-descriptive research design, and a randomized cross-sectional survey. A sample of 60 respondents were surveyed for the study. The study findings concluded that ICT remains very important in the functioning of hospitality because it adds value to the industry in terms of widening their client base, improving their operation and feedback. Despite these findings, it is evident that the issue of ICT update in hotel industries is still limited particularly in the arrays of conceptualizing ICT integration and hotel performance. For the purpose of this study, ICT integration will be viewed from the lens of ICT tools uptake and effectiveness while hotel performance is conceptualized as operational efficiency and customer satisfaction.

**Methodology**

**Study Area**

The study area used for this study is Lagos. Lagos is one of the states in Nigeria that lies in the Southwest region of Nigeria. Its geographical location is roughly between Latitudes 6°22' and 6°2' North of the Equator and Longitudes 20o42’ and 32o2 East of the Greenwich Meridian. It is bordered by Ogun state to the North and East, Republic of Benin to the West and Atlantic Ocean to the South (Figure 1). Lagos is known for its rich cultural and economic activities which attract people from all over the world making its hospitality industry flourish (Onyeonoro et al., 2023), with an array of hotels of different classes and category. It was estimated that Lagos State will have a population of 15,946,000 inhabitants living there in 2024 (United Nations Habitat, 2023).



**Figure 1: Map of Lagos, Nigeria**

**Research Design and Sampling Procedure**

The research employed the quantitative-descriptive research design which entails survey method for the data collection and the quantitative method of data analysis (Richard, 2023). To this end, a total of 400 participants were selected for the study using the Yamane (1967) sampling technique. It is also generally accepted that a sampling size of 400 is appropriate to cater sample with a population that is higher than 100,000. For more accuracy and authenticity of data, the participants comprised the hotel guests in Lagos. The sample data was collected using the multistage sampling technique. At the first stage, purposive sampling technique was used to select a total of 40 hotels in Lagos. At the second stage, a simple random sampling technique was used to select a total of 10 guests in each hotel.

**Data Collection**

Data for this study was collected using a self-designed questionnaire which has three sections, Section A included items on the socio-demographic characteristics of the respondents, Section B contained items on ICT integration (ICT technologies availability and effectiveness) while Section C contained items on hotel performance. The items were self-designed with a four-point Likert scale, which included: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The instrument reliability was ascertained using the test-retest method. The instrument was administered on 10 hotels in Abeokuta twice within the space of 2 weeks and the result obtained were correlated. A correlation coefficient of 0.71 was obtained which was considered good enough for the instrument's reliability. After the pilot study, the instrument was administered to the participants with the help of two research assistants. A consent form was attached to the questionnaire which was to ensure that the participants gave their consent prior to providing their opinion on the questionnaire. Copies of the instruments were retrieved immediately after they were filled, and guidance was provided when needed. All the copies of the questionnaire were retrieved giving an accurate response rate.

**Data Analysis**

Data collected were analyzed with the aid of Statistical Packages for Social Sciences (SPSS) using descriptive and inferential statistical techniques. Mean and standard deviation was used to describe the data while regression analysis was done at 0.05 level of significance.

**Note:** For easy comprehension and analysis Strongly Agreed (SA) and Agreed (A) are merged as Agreed while Disagreed (D) and Strongly Disagreed (SD) are merged as Disagreed.

**Results**

**Figure 1: Availability of ICT Integration in the selected Hotels in Lagos**

Figure 1 presents results on the guests’ observations and experience on the availability of ICT applications in the selected hotels. It was revealed that most of the hotels make use of ICT for reservations (*f*=215), in-room technology (*f*=207), e-payment (*f*=377), security system (*f*=249) and energy management (*f*=201) while others like property management (f=102), customer relationship (f=122) and Wi-Fi technology (*f*=101) were only integrated by fewer hotels in Lagos. Furthermore, it was revealed that mobile technology is rarely integrated by the hotels in Lagos State. In essence, the availability of ICT integration in most of the hotels were still limited, most especially when it deals with customer relationship, wireless technology, and property management.

**Table 1: Effectiveness of ICT Integration for Operational Efficiency and Service Delivery**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ICT Integration** | **Effective** | **Ineffective** | **Mean** | **SD** |
|  | ***f*** | ***%*** | ***f*** | ***%*** |  |  |
| Reservations | 273 | 68.3 | 127 | 31.7 | 3.37 | 0.221 |
| Property Management  | 104 | 26.0 | 296 | 74.0 | 2.42 | 0.746 |
| Customer Relationship | 121 | 30.3 | 279 | 69.7 | 2.61 | 0.518 |
| In-Room Technology | 294 | 73.5 | 106 | 26.5 | 3.47 | 0.266 |
| Wireless Technology | 186 | 46.5 | 214 | 53.5 | 2.93 | 0.318 |
| Mobile Applications  | 97 | 24.3 | 303 | 75.7 | 2.33 | 0.749 |
| E-payments System | 366 | 91.5 | 34 | 8.5 | 3.84 | 0.146 |
| Security System | 217 | 54.3 | 183 | 45.7 | 3.09 | 0.229 |
| Energy Management System | 219 | 54.7 | 181 | 45.3 | 3.15 | 0.375 |

Result presented in Table 1 on the effectiveness of ICT integration for operational efficiency and service delivery in hotels in Lagos reveals that based on effectiveness, electronic payment system ($\overbar{x}$=3.84) remains of the most effective. This is closely followed by in-room technology ($\overbar{x}$=3.47), reservations ($\overbar{x}$=3.37), energy management ($\overbar{x}$=3.15) and security system ($\overbar{x}$=3.09). However, others like customer relationship ($\overbar{x}$=2.61), wireless technology ($\overbar{x}$=2.93), property management ($\overbar{x}$=2.42) and mobile applications ($\overbar{x}$=2.33) were not considered effective by the guests.

**Table 2: Effect of ICT Integration on Hotel Performance (Operational Efficiency)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **β** | **t** | **p** | **R2** | **F** | **Sig.** |
| Availability of ICT technologies  | .015 | 0.866 | .429 | .184 | 13.69 | .011 |
| Effectiveness of ICT technologies  | .127 | 6.338 | .027 |

The result in Table 2 showing the regression summary on the effect of ICT integration on hotel performance (Operational efficiency) revealed that availability of ICT technologies does not significantly influence operational efficiency of hotels in Lagos (t= 0.866, p>.05). However, effectiveness of ICT technologies significantly influences operational efficiency of hotels in Lagos (t=6.338, p<.05). Furthermore, the result showed that there is an interactive effect of ICT integration on operational efficiency of hotels in Lagos (F=13.69, p>.05) accounting to about 18.4% of the total factors influenced operational efficiency of hotels in Lagos State, Nigeria.

**Table 3: Effect of ICT Integration on Hotel Performance (Customer Satisfaction)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **β** | **t** | **p** | **R2** | **F** | **Sig.** |
| Availability of ICT technologies  | .114 | 5.173 | .014 | .207 | 22.17 | .003 |
| Effectiveness of ICT technologies  | .127 | 8.112 | .001 |

Regression result presented in Table 3 on the effect of ICT integration on Hotel Performance (Customer satisfaction) revealed that both availability of ICT technologies (t=5.173, p<.05) and effectiveness of ICT technologies (t=8.112, p<.05) have a significant individual effect on customer satisfaction. In essence, customers could feel impressed and satisfied by merely knowing that ICT resources are available in the hotel. In addition, the result showed that availability and effectiveness of ICT have an interactive influence on customer satisfaction (F=22.17, p<.05). The co-efficient of determination showed that ICT integration accounted for 20.7% of the total factors influencing customer satisfaction in hotels located in Lagos.

**Table 4: Challenges to the Effectiveness of ICT Integration by Hotels in Lagos**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Challenges**  | **Agree** | **Disagree** | **Mean** | **SD** |
|  | ***f*** | ***%*** | ***f*** | ***%*** |  |  |
| Infrastructural deficiency | 194 | 48.5 | 206 | 51.5 | 2.97 | 0.373 |
| High cost of technology | 286 | 71.5 | 114 | 28.5 | 3.42 | 0.149 |
| Low technical skills | 309 | 77.3 | 91 | 22.7 | 3.54 | 0.086 |
| Insecurity | 279 | 69.8 | 121 | 30.2 | 3.39 | 0.114 |
| Unfavourable policies | 191 | 47.8 | 209 | 52.2 | 2.95 | 0.822 |
| Cultural/Individual differences | 144 | 36.0 | 256 | 64.0 | 2.72 | 0.878 |

Data presented on the challenges to the effectiveness of ICT integration by hotels in Lagos revealed that all the identified factors constituted major challenges to the effectiveness of ICT integration by hotels in Lagos. However, this was more pronounced in some hotels due to low technical skills (x̅=3.54), which had the highest mean score. Also, the high cost of technology (x̅=3.42) and insecurity (x̅=3.39) were major factors to consider. In contrast, unfavorable policies (x̅=2.95) and cultural/individual differences (x̅=2.72) might not be major factors.

**Discussion**

The findings from the study reveal that hotels in Lagos have integrated a range of ICT tools to enhance their operations and guest experiences. Among the most commonly adopted ICT applications are reservation systems, in-room technology, e-payment systems, security systems, and energy management systems. These tools enable hotels to streamline their processes, improve service delivery, and offer modern amenities to guests (Ezzaouia & Jacques, 2022; Poldrugovac et al., 2016). However, certain applications such as property management systems, customer relationship management, and wireless technology are less prevalent, indicating potential areas for further investment and development in ICT infrastructure among hotels in Lagos.

The study also assesses the effectiveness of various ICT tools in improving hotel performance, with electronic payment systems emerging as the most effective integration, followed by in-room technology, reservations, energy management, and security systems. It suggests that certain ICT applications have a significant impact on enhancing operational efficiency and service delivery within hotels in Lagos (Onyeonoro et al., 2023). However, other tools such as customer relationship management, wireless technology, property management, and mobile applications are perceived as less effective by guests, indicating areas for improvement and optimization to maximize the benefits of ICT integration for hotel performance.

The regression analysis conducted in the study reveals that the effectiveness of ICT technologies significantly influences operational efficiency and customer satisfaction in hotels in Lagos. While the availability of ICT technologies does not exert a significant influence on operational efficiency, the interactive effect of ICT integration enhances both operational efficiency and customer satisfaction (Richard, 2023; Sirirak et al., 2011; Oke, 2023). These findings show the importance of not only adopting ICT tools but also ensuring their effectiveness and integration into hotel operations to drive positive outcomes for both the hotel and its guests. Lastly, the study identifies several challenges hindering the effectiveness of ICT integration in hotels in Lagos, including low technical skills, high cost of technology, security concerns, unfavorable policies, and cultural/individual differences. These challenges pose obstacles to the successful implementation and utilization of ICT tools among hotels in Lagos.

**Conclusion/Implication**

This study investigated the effectiveness of ICT integration on performance of hotels in Lagos, specifically on its operational efficiency and customers’ satisfaction. Specifically, the study highlights the widespread adoption of certain ICT applications such as reservation systems and in-room technology, while others like customer relationship management and mobile technology are less prevalent. Furthermore, it was evident that while the availability of ICT technologies does not significantly influence operational efficiency, the effectiveness of ICT technologies significantly impacts both operational efficiency and customer satisfaction. This emphasizes the importance of not only adopting ICT tools but also ensuring their effectiveness and integration into hotel operations. The major challenges that attributed to poor efficiency in the integration ofICT in the hotels were low technical skills, high cost of technology, security concerns, unfavorable policies, and cultural/individual differences. The implication is that hotels in Lagos, Nigeria recognize the significance of leveraging ICT to enhance operations, improve customer satisfaction, and maintain competitiveness. However, while they acknowledge the importance of ICT, their implementation and integration into operations remain limited. Therefore, stakeholders must invest in skill development, advocate for enhanced security measures, and promote favorable policies conducive to technological innovation within the hospitality industry.

**Limitation and Suggestion for Future Research**

Despite the success of this study examining the effectiveness of ICT integration on hotel performance in Lagos, it is still limited in conceptualizing both ICT integration and hotel performance. Other studies can explore areas such as specific ICT resource, particularly e-payment and reservations and its effect on patronage pattern of hotels in Lagos or other parts of Nigeria.

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