AUTOMATED SERVICE DELIVERY SYSTEM AND CUSTOMER SATISFACTION OF HOTELS

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Abstract
This research investigated the effect of automated service delivery system (online booking, self-service, check-in kiosk and smart room service) on customer satisfaction of selected hotels in Calabar Metropolis. The cross-sectional survey research design was adopted for the study, and primary data were obtained from 266 hotel customers in Calabar Metropolis using a 5-point Likert scale questionnaire. Descriptive statistics was employed to analyse data, while hypotheses tested using simple linear regression in the Statistical Package for the Social Sciences (SPSS 23). The findings revealed that online booking, self-service check-in kiosk and smart room service had significant positive effects on customer satisfaction of hotels in Calabar Metropolis. Consequently, the following recommendations were made: hotels in Calabar Metropolis should maintain an online booking system that will enable potential customers to conveniently make reservations without physically visiting the business premises; self-service check-in kiosk technologies should be installed by hotels to facilitate seamless check-ins and check-outs by guests; and smart room service technologies should be adopted by hotels to provide guests with convenient, error-free and satisfactory room service throughout the duration of their stay.

Keywords: Automated delivery, customer satisfaction, online booking, self-service, check-in kiosk and smart room

Introduction

The delivery of hospitality services especially by hotels has changed significantly over the past few years, rapidly transiting from traditional brick-and-mortar delivery systems to automated service delivery systems that are faster, more effective and efficient. (Ivanov, Webster & Berezina, 2017). This transition is necessitated by the growing population of people using hotel services, and hotels' desire to enhance their performance at minimal costs (Melián-González & Bulchand-Gidumal, 2016). In view of the benefits of service automation, many firms are rapidly developing and deploying automated service delivery system to facilitate their businesses and enhance customer satisfaction (Cobanoglu, Berezina, Kasavana & Erdem, 2018).

Farah and Ashraf (2017), Mattsson and Orfila-Sintes (2018) and Ndikubwimana and Lwakabamba (2018) opine that automated service delivery system is the design, programming and utilization of smart technologies as well as information and communication systems to facilitate the delivery of services to consistently ensure customer satisfaction through cost

minimization, prevention of service failure and gaining competitive advantages over rivals. Various systems of service automation have been designed and applied by hotels around the globe but this study centered on online booking, self-service check-in kiosks and smart room service of hotels in Calabar Metropolis.

According to Wang, Cheung, Feng and Chongyi (2019), an online booking system is a piece of a software used for reservation management. Basically, it allows a potential customer to book and pay for a hospitality/hotel service directly through a website or software programme. On the other hand, self-service check-in kiosk is an automated software or digital touch kiosk that allows guests to expedite more routine tasks like booking, check-ins, checkouts, and room service requests by themselves instead of relying on hotel front desk staff. (Sotoro, Gumilang & Xuequn, 2020). While, a smart room service is an automated software accessible on a smartphone or tablet which enables hotel guests to expeditiously access room service such as order a meal, request for housekeeping service, and control amenities within the room (Ming & Zhang, 2019). Employing these and other consumer-friendly technologies, help potential hotel guests to log onto the official websites of hotels and make a room reservation without leaving their homes or offices. The application of service delivery automation systems resulted in the improvement of overall customer satisfaction in countries such as Japan, China and South Korea (Akihiko, Tanakana & Fujita, 2018; Wang, Cheung, Feng & Chongyi, 2019; Ming & Zhang, 2019). This study was therefore conducted to determine the effect of service delivery automation systems on customer satisfaction by selected hotels in Calabar Metropolis, Cross River State, Nigeria.

Statement of the Problem

Despite the acclaimed benefits of automated service delivery, most hotels in Nigeria are yet to fully build integrated and functional automated service delivery systems, due to lack of financial resources, infrastructure (such as electricity, and reliable internet connectivity), technology and technical know-how, as well as poor innovative spirit among managers (Nwakanma, Ubani, Asiegbu & Nwokonkwo, 2014; Lawal, Logunleko & Olaitan, 2020). As such, a majority of hotels in Nigeria still operate the traditional brick-and-mortar systems that are rigged with human errors and avoidable service delays, failures, impolite personnel behaviour and inconveniences in accessing hotel services (Olugbemi, Ogungbayi & Onasanya, 2020).

A series of scholarly studies have been conducted to investigate the correlation and influence of service delivery automation on customer satisfaction. It has been observed that majority of those studies were in European, Asian countries and others such as Malaysia, China, Japan, South Korea, Jordan, United Arab Emirates, Norway, among others (Sotoro, Gumilang & Xuequn, 2020; Kılıçhan& Yılmaz, 2020; Cobanoglu, Berezina, Kasavana & Erdem, 2018; Johannes & Kristoffer, 2020; Akihiko, Tanakana & Fujita, 2018; Wang, Cheung, Feng & Chongyi, 2019; Ming & Zhang, 2019; Abu-Faleh, Muhammad & Ismaila, 2020). However, not much research attention has been given to the subject in the African context due to the possibility of slow automation trends in hotels as a result of poor infrastructure and technology. Only a few studies have been done in East African countries such as Rwanda (Ndikubwimana & Lwakabamba, 2018), while West African countries under-researched in this regard.

There subsist inadequate empirical evidence to ascertain the correlation between hotel service automation and customer satisfaction in the African context and Nigeria in particular. Against this backdrop, this study was conducted to determine the effect of automated service delivery system (online booking, self-service check-in kiosks and smart room service) on customer satisfaction of hotels in Calabar, Nigeria.

Research Objectives

1. To examine the effect of online booking on customer satisfaction of hotels in Calabar.
2. To determine the effect of self-service check-in kiosk on customer satisfaction of hotels in Calabar.

3. To assess the effect of smart room service on customer satisfaction of hotels in Calabar.

Research Hypotheses

Ho_1: Online booking has no significant effect on customer satisfaction of hotels in Calabar.

Ho2: Self-service check-in kiosk has no significant effect on customer satisfaction of hotels in Calabar.

Ho_3: Smart room service has no significant effect on customer satisfaction of hotels in Calabar.

Theoretical Framework

This study is hinged on the core competency theory, propounded by Hamel and Prahalad, by two business management theorists in 1990. It was introduced in published paper called "The Core Competence of the Corporation". The theory is a strategic management tool which prescribes actions to be taken by firms to achieve competitive advantage in the marketplace. It states that firms must develop and harness their areas of strength in order to build core competencies that will enable them acquire competitive advantages that lead to long-term company growth. Its premise is that a business organization must define, cultivate, and exploit its core competencies in order to succeed against the competition. Hamel and Prahalad (1990), assert that a core competency is a harmonized combination of multiple resources and skills that distinguish a firm in the marketplace and therefore are the foundation of companies' competitiveness. Core competencies fulfill three basic criteria namely: provide potential access to a wide variety of markets, make a significant contribution to the perceived customer benefits of the end product, and difficult to imitate by competitors. Also, Agha, Alrubaiee and Jamhour (2012), and Kawshala (2017), opine that core competencies are particular strengths, resources and capabilities that comprise the strategic advantages of a business organization relative to competitors in the industry.

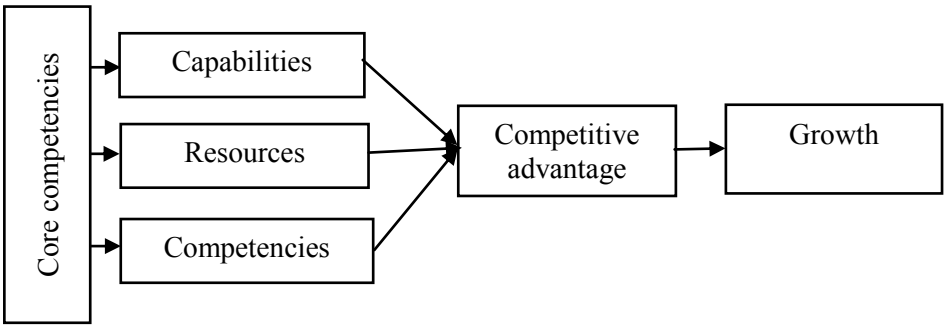

Fig. 1: The core competency theory

Source: Kawshala, H. (2017). Theorizing the concept of core competencies: An integrative model beyond identification. *International Journal of Scientific and Research Publications*, *7*(2), 253-256

Capabilities: Capabilities are critical resources of firm's performance. They are the knowledge, skills or know-how of the people in the organisation such as customer relationship, product development, or supply chain management, rather than mere company's resources like financial, manpower or technology.

Resources: Resources are economic or productive factors required to accomplish an activity or as means to undertake an enterprise and achieve desired outcome. They consist of land, labor, capital, energy, entrepreneurship, information, expertise, management, time, etc.

Competencies: Competencies are an assembly of related abilities, commitments, knowledge, and skills that enable a person or an organization to act effectively in a job or a situation. It indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations.

Conceptual Framework

This study examined automated service delivery system and customer satisfaction in hospitality firms in Calabar, Nigeria. The independent variable (automated service delivery system) was split into three (3) specific variables, namely: online booking, self-service check-in kiosks and smart room service; whereas the dependent variable (customer satisfaction) was measured using customer patronage, customer comfort and repeat patronage.

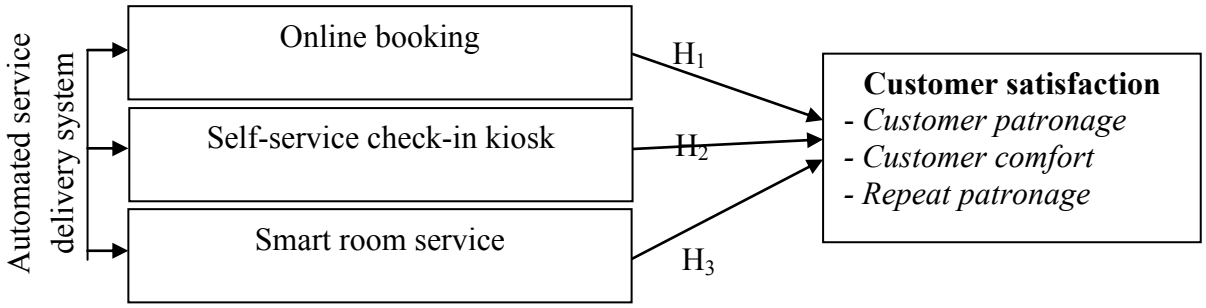

Fig. 2: Conceptual Model of the Study

Source: Adapted from Wang, R., Cheung, F., Feng, S. & Chongyi, P. (2019). Hotel service automation and customer satisfaction in the Chinese hospitality sector. *Journal of Hospitality Marketing & Management, 29*(7), 739-756.

In the context of this study, online booking is an innovative service offering whereby potential customers of hotels can pay for, book or reserve rooms and other hospitality services ahead of their actual visit to the hotels. Self-service check-in kiosk is an automated software or digital touch kiosk that allows guests to expedite more routine tasks like booking, check-ins, checkouts, and room service requests by themselves instead of relying on hotel front desk staff. Similarly, a smart room service is an automated software accessible on a smartphone or tablet which enables hotel guests to expeditiously access room service such as order a meal, request for housekeeping service, and control amenities within the room. With respect to the dependent variable, this study conceived customer satisfaction (customer patronage, customer comfort and repeat patronage) as a feeling of excitement or gratification experienced by guests when hotel services consumed meet or exceed their expectations.

Automated Service Delivery System

Automated service delivery system is the design, programming and utilization of smart technologies as well as information and communication systems to facilitate the delivery of services to consumers. It is as also known as process automation, robotic process automation, intelligent process automation, machine learning, and artificial intelligence (Farah & Ashraf, 2017). In the view of Willcocks and Lacity (2016), it is a network of interrelated computers and digital technologies that enable and support the delivery of services to users with minimal or no human intervention. It helps to enable a digitally equipped enterprise or a business to transform service delivery and operations to enhance cost savings, accuracy, and productivity scale.

Service automation as the development and application of artificially-intelligent software and hardware technologies to help enterprises deliver basic services to consumers with little or no human interference in order to ensure consistent customer satisfaction (Ivanov, Webster & Berezina, 2017; Mattsson & Orfila-Sintes, 2018)

In support of this assertion, Rosete, Soares, Salvadorinho, Reis and Amorim (2020) submit that global hotels are using automation to expedite guests' reservation, check-in and check-out processes, facility navigation by guests, guests' entertainment and room service delivery processes. Some ways hotels can

incorporate the use of automated processes, is the introduction of self-service kiosks which enable customers to check in and out during their stay.

These kiosks are usually situated in the lobby and allow guests to access their room key using their reservation number or name. Sharma, Shin, Santa-María and Nicolau (2021) argued that some hotels are attempting to create an entirely human-free experience through the use of multiple integrated automated systems. Comfort Xpress Hotel in Oslo, Norway is one hotel which has made this move. Customers can check in using their reference details via a mobile app; this allows them to use their phone as their key card through a mobile key system. Hotel and in-room services are accessible through the app and through a web interface, so guests can make bookings for leisure and food facilities without the need to speak to frontline staff. Bookings are then updated on the key card, allowing guests to enter the facilities they have chosen.

In Japan, a hotel named Henn-na Hotel has taken this even further and created a hotel staffed entirely by robots. Guests are greeted by actoid androids which look and act like humans (Reis, Melão, Salvadorinho, Soares & Rosete, 2020). These robots are accompanied by kiosks which allow guests to check in, or in the restaurant order their food. An automated motorized trolley allows customers to input their details and have their luggage taken to their room, and cleaning is also conducted out by robots. Those were attempts to be more efficient in terms of cost and customer service.

Customer Satisfaction

Customer satisfaction is a measure of how products and services supplied by a company meet or surpass customer expectations. It is the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals. In a competitive marketplace where businesses compete for customers, customer satisfaction is seen as a key differentiator, increasingly has become a key element of business strategy and gaining customer loyalty (Paul, Neil, Bendle, Phillip & David, 2010; Prakash & Mohanty, 2012; Robertson, 2019). According to Bernazzani (2018), customer satisfaction is a metric used to quantify the degree to which a customer is happy or feel fulfilled with a product, service, or experience. Juneja (2019) explains that customer satisfaction is a part of customer's experience that exposes a supplier's behavior on customer's expectation. It also depends on how efficiently it is managed and how promptly services are provided. This satisfaction could be related to various business aspects like marketing, product manufacturing, engineering, quality of products and services, responses customer's problems and queries, completion of project, post delivery services, complaint management etc.

Empirical Review

Some empirical studies conducted by researchers to demonstrate the cause-and-effect relationship between automated service delivery system and customer satisfaction of hotels and other hospitality firms are briefly discussed below.

Sotoro, Gumilang and Xuequn (2020) conducted a study on "The impact of artificial intelligence on customer satisfaction and loyalty". It determined the impacts of chatbots, smart room service, self-check-in kiosks, and online booking on customer satisfaction and loyalty in Indonesian hotels. Primary data were obtained from 158 guests of 5 luxury hotels in Bali using a 5-Point Likert Scale questionnaire and personal interview. Data analysis was done using descriptive and inferential statistics (multiple regression analysis). Their findings revealed that chatbots, smart room service, self-check-in kiosks, and online booking had significant impacts on customer satisfaction and loyalty in Bali luxury hotels.

Kılıçhan and Yılmaz (2020) investigated "Artificial intelligence and robotic technologies in tourism and hospitality industry". It studied the influences of self-service booking kiosks, smart room service, chatbots, virtual booking, and remote check-out service on guests' satisfaction in Jordan hotels. Primary data were collected from 209 hotel guests in Amman Metropolis using a structured questionnaire.

Data analysis was done using descriptive statistics and multi-variate regression analysis. Their findings revealed that self-service booking kiosks, smart room service, chatbots, virtual booking, and remote check-out service had significant influences on guests' satisfaction in the Jordanian hospitality industry. Similarly, Cobanoglu, Berezina, Kasavana and Erdem (2018) conducted a study on "The impact of technology amenities on hotel guest overall satisfaction". The aim of the study was to assess the impacts of smart keycards, smart room service, chatbots, self-service kiosks, remote booking/reservations and smart location navigator on guest satisfaction. Primary data were obtained from 312 guests of selected hotels in Stockholm using a 7-point Likert structured questionnaire. Data were analyzed using descriptive statistics and multiple linear regression. The findings revealed that smart keycards, smart room service, chatbots, self-service kiosks, remote booking/reservations and smart location navigator had significant positive impacts on hotel guest satisfaction in Stockholm, Sweden.

Also, Johannes and Kristoffer (2020) conducted a study on "Service delivery innovation and customer satisfaction in the Norwegian hospitality industry". The specific purpose of the study was to investigate the relationship between service delivery automation (virtual assistants, self-service kiosk, online booking, and digital room service) and customer satisfaction in Norway. The researchers obtained primary data from 186 customers of selected luxury hotels in Oslo using a mail-delivered structured questionnaire. The data were statistically analyzed using descriptive statistics and Pearson's Product Moment Correlation. The findings of the study therefore revealed that service delivery innovation (virtual assistants, self-service kiosk, online booking, and digital room service) had significant positive relationships with customer satisfaction in the Norwegian hospitality industry. Similarly, Akihiko, Tanakana and Fujita (2018) investigated "Service delivery automation and customer satisfaction in Japanese luxury hotels". The aim of the study was to determine the correlation between service delivery automation (smart room service, chatbot assistants, remote check-in/check-out and self-service kiosks) and customer satisfaction in Japanese luxury hotels. The authors collected primary data from 205 customers and staff of hotels in Toyohashi Metropolis using a 5-point Likert scale questionnaire. The data were statistically analyzed using Pearson's correlation and multiple regression analysis. The findings therefore revealed that service delivery automation (smart room service, chatbot assistants, remote check-in/check-out and self-service kiosks) had significant correlations and effects on customer satisfaction in Japanese luxury hotels.

Furthermore, Wang, Cheung, Feng and Chongyi (2019) conducted a study on "Hotel service automation and customer satisfaction in the Chinese hospitality sector". The aim of the study was to examine the effects of self-service kiosk, remote booking/reservation, smart room service and robotic assistant on customer satisfaction in the Chinese hospitality sector. Primary data were collected from 341 customers of selected hotels in Hong Kong using a 5-point Likert scale questionnaire. The data were statistically analyzed using multiple regression analysis. The findings subsequently revealed that self-service kiosk, remote booking/reservation, smart room service and robotic assistant had significant effects on customer satisfaction in the Chinese hospitality sector. Also, Ming and Zhang (2019) examined "Hotel service innovation and guests' satisfaction in Seoul". The purpose of the study was to demonstrate the influences of self-service kiosk, smart room service and online reservations on guests' satisfaction (patronage and repeat patronage) in Seoul. The study obtained primary data from 252 hotel guests in selected luxury hotels in Seoul using a structured questionnaire. Data analysis was done using descriptive statistics and simple linear regression analysis. The findings of the study consequently revealed that self-service kiosk, smart room service and online reservations had significant influences on guests' satisfaction (patronage and repeat patronage) in Seoul.

Also, Abu-Faleh, Muhammad and Ismaila (2020) conducted a study on "Service automation and hotel guests' satisfaction: A correlation analysis". The purpose of the study was to assess the correlation between service automation (virtual chatbots, smart room service, self-service kiosks and remote reservations) and hotel guests' satisfaction in the United Arab Emirates. The researchers obtained primary data from 183 hotel guests in Abu Dhabi using a 5-point Likert scale questionnaire. Descriptive statistics and Pearson's product moment correlation were the statistical tools adopted for data collection. The findings therefore revealed that there is a significant positive correlation between service automation (virtual chatbots, smart room service, self-service kiosks and remote reservations) and hotel guests' satisfaction in the United Arab Emirates. Similarly, Ndikubwimana and Lwakabamba (2018) conducted a study on "The impact of service delivery automation on customer satisfaction in 5-star hotels in Kigali". The purpose of the study was to determine the impacts of self-service kiosks, remote reservation, virtual chatbots, and smart room service on customer satisfaction (customer patronage and customer referral) in Kigali. The study obtained primary data from 200 customers of 5-star hotels in Kigali Metropolis using a personally-delivered structured questionnaire. The statistical tools adopted to analyze the data collected were descriptive statistics and multiple regression analysis. The findings of the study therefore revealed that self-service kiosks, remote reservation, virtual chatbots, and smart room service had significant positive impacts on customer satisfaction (customer patronage and customer referral) in 5-star hotels in Kigali.

Finally, Farah and Ashraf (2017) conducted a study on "Hotel service automation and guests' satisfaction in the Malaysian hospitality sector". The aim of the study was to determine the correlation and impact of online reservation, self-service kiosk, smart room service and virtual chatbots on guests' satisfaction in the Malaysian hospitality sector. The researchers collected primary data from 183 hotel guests in Kuala Lumpur using a 7-point Likert scale structured questionnaire. The data obtained were analyzed statistically using descriptive statistics, correlation analysis and multiple regression. The findings of the study therefore revealed that online reservation, self-service kiosk, smart room service and virtual chatbots had significant correlations and impacts on guests' satisfaction in the Malaysian hospitality sector.

Methodology

The study was conducted in Calabar Metropolis and research design was the cross-sectional survey. Convenience sampling technique was employed to select respondents from the identified hotels in Calabar Metropolis who were easily accessible, readily available and willing to participate in the survey. A sample 375 hotel customers (guests) in Calabar Metropolis were used for study.

A 5-point Likert scale structured questionnaire was used to collect data from customers of hotels in Calabar Metropolis at one single point in time for analysis and findings generation. was adopted. The instrument comprised two (2) sections, namely: Section A: Respondents' bio-data, while Section B: Statements related to the variables of the study: online booking, self-service check-in kiosks, smart room service and customer satisfaction). Respondents' opinions were measured on the following Likert scales: strongly agree (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD). Data analysis was done using descriptive statistics, while hypotheses were tested using simple linear regression in the Statistical Package for the Social Sciences (SPSS 23).

Analysis and Results

A total number of 375 copies of the questionnaire were administered to guests of selected hotels in Calabar Metropolis, 266 copies were successfully retrieved while 109 copies were not retrieveable giving a response rate of 70.9 percent.

Test of Hypotheses

Decision criteria: Accept the alternative hypothesis if ($P < .05$) and reject the null hypothesis, if otherwise.

Hypothesis One

Ho: Online booking has no significant effect on customer satisfaction of hotels in Calabar.

Table 1: Model summary of the effect of online booking on customer satisfaction of hotels in Calabar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620[a]	.483	.480	.53642

a. Predictors: (Constant), Online booking

Table 2: ANOVA of the effect of online booking on customer satisfaction of hotels in Calabar

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	85.030	1	85.030	246.464	.009[b]
	Residual	90.963	264	.345		
	Total	175.993	265			

a. Dependent Variable: Customer satisfaction

b. Predictors: (Constant), Online booking

Table 3: Coefficients of the effect of online booking on customer satisfaction of hotels in Calabar

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.382	.141		23.991	.000
	Online booking	.213	.041	.620	12.321	.009

a. Dependent Variable: Customer satisfaction

Interpretation

The results on tables 1, 2 and 3 show the linear regression analysis of the effect of online booking on customer satisfaction of hotels in Calabar. Table 1, which is the model summary reveals that the correlation (relationship) between both variables (online booking and customer satisfaction) is 62.0 percent (as seen in the R column), which indicates a very strong degree of correlation. The coefficient of determination (R^2) of 0.483 indicates that up to 48.3 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (online booking). This implies that a unit change in online booking will affect customer satisfaction in hospitality firms by up to 48.3 percent when other factors are held constant.

The F-test (246.464, $P < 0.05$) statistic in table 2 indicates that the overall prediction of the dependent variable by the independent variable is statistically significant; therefore, the regression model provides substantive evidence to conclude that online booking has a significant effect on customer satisfaction of hotels in Calabar. Also, the coefficient table (table 3) shows that the independent variable (online booking) significantly contributes to the model as the P value (0.009) is less than 0.05 error margin, and the t-test result ($t = 12.321$) explains that the relationship between both variables is a direct and positive one. Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted, which leads to the conclusion that online booking has a significant effect on customer satisfaction of hotels in Calabar.

Hypothesis Two

Ho: Self-service check-in kiosk has no significant effect on customer satisfaction of hotels in Calabar.

Table 4: Model summary of the effect of self-service check-in kiosk on customer satisfaction of hotels in Calabar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.630[a]	.502	.499	.50644

a. Predictors: (Constant), Self-service check-in kiosk.

Table 5: ANOVA of the effect of the effect of self-service check-in kiosk on customer satisfaction of hotels in Calabar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88.283	1	88.283	265.913	.000[b]
	Residual	87.710	264	.332		
	Total	175.993	265			

a. Dependent Variable: Customer satisfaction

b. Predictors: (Constant), Self-service check-in kiosk

Table 6: Coefficients of the effect of self-service check-in kiosk on customer satisfaction of hotels in Calabar

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.681	.120		22.374	.000
	Self-service check-in kiosk	.205	.036	.630	5.683	.000

a. Dependent Variable: Customer satisfaction

Interpretation

The results on tables 4, 5 and 6 show the linear regression analysis of the effect of self-service check-in kiosk on customer satisfaction of hotels in Calabar. Table 4, which is the model summary reveals that the correlation (relationship) between both variables (self-service check-in kiosk and customer satisfaction) is 63.0 percent (as seen in the R column), which indicates a very strong degree of correlation. The coefficient of determination (R^2) of 0.502 indicates that up to 50.2 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (self-service check-in kiosk). This implies that a unit change in self-service check-in kiosk will affect customer satisfaction in hospitality firms by up to 50.2 percent when other factors are held constant.

The F-test (265.913, $P < 0.05$) statistic in table 5 indicates that the overall prediction of the dependent variable by the independent variable is statistically significant; therefore, the regression model provides substantive evidence to conclude that self-service check-in kiosk has a significant effect on customer satisfaction of hotels in Calabar. Also, the coefficient table (table 6) shows that the independent variable (self-service check-in kiosk) significantly contributes to the model as the P value (0.000) is less than 0.05 error margin, and the t-test result ($t = 5.683$) explains that the relationship between both variables is a direct and positive one. Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted, which leads to the conclusion that self-service check-in kiosk has a significant effect on customer satisfaction of hotels in Calabar.

Hypothesis Three

Ho: Smart room service has no significant effect on customer satisfaction of hotels in Calabar.

Table 7: Model summary of the effect of smart room service on customer satisfaction of hotels in Calabar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.503[a]	.426	.422	.53652

a. Predictors: (Constant), Smart room service

Table 8: ANOVA of the effect of smart room service on customer satisfaction of hotels in Calabar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.001	1	75.001	195.825	.004[b]
	Residual	100.992	264	.383		
	Total	175.993	265			

a. Dependent Variable: Customer satisfaction
b. Predictors: (Constant), Smart room service

Table 9: Coefficients of the effect of smart room service on customer satisfaction of hotels in Calabar

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.333	.133		25.051	.000
	Smart room service	.302	.143	.503	7.045	.004

a. Dependent Variable: Customer satisfaction

Interpretation

The results on tables 7, 8 and 9 show the linear regression analysis of the effect of smart room service on customer satisfaction of hotels in Calabar. Table 7, which is the model summary reveals that the correlation (relationship) between both variables (smart room service and customer satisfaction) is 50.3 percent (as seen in the R column), which indicates a strong degree of correlation. The coefficient of determination (R^2) of 0.426 indicates that up to 42.6 percent of the variability in the dependent variable (customer satisfaction) is accounted for by the independent variable (smart room service). This implies that a unit change in smart room service will affect customer satisfaction in hospitality firms by up to 42.6 percent when other factors are held constant.

The F-test (195.825, $P < 0.05$) statistic in table 8 indicates that the overall prediction of the dependent variable by the independent variable is statistically significant; therefore, the regression model provides substantive evidence to conclude that smart room service has a significant effect on customer satisfaction of hotels in Calabar. Also, the coefficient table (table 9) shows that the independent variable (smart room service) significantly contributes to the model as the P value (0.004) is less than 0.05 error margin, and the t-test result ($t = 7.045$) explains that the relationship between both variables is a direct and positive one. Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted, which leads to the conclusion that smart room service have a significant effect on customer satisfaction of hotels in Calabar.

Discussion of Findings

The finding from the test of hypothesis one revealed that online booking had a significant effect on customer satisfaction of hotels in Calabar. This finding is corroborated by the study of Sotoro, Gumilang and Xuequn (2020), and Kılıçhan and Yılmaz (2020). Hypothesis two finding revealed that self-service check-in kiosk has a significant effect on customer

satisfaction of hotels in Calabar. This finding aligns with the studies of Cobanoglu, Berezina, Kasavana and Erdem (2018), and Johannes and Kristoffer (2020). Finally, test of hypothesis three revealed that smart room service has a significant effect on customer satisfaction of hotels in Calabar. This finding corresponds with the study of Akihiko, Tanakana and Fujita (2018), and Wang, Cheung, Feng and Chongyi (2019).

Conclusion

Service automation has fundamentally revolutionized the service delivery in the global hotel business; and enabled great progress of hotels around the world. Automation of services is paving the way for hotels to deliver fast-paced, error-free, highly customized and cost-efficient services to customers. Findings of the study revealed that online booking, self-service check-in kiosk and smart room service had significant positive effects on customer satisfaction in hotels in Calabar, Nigeria. Based on these findings, the researchers conclude that automated service delivery system has positive significant effect on customer satisfaction in the Nigerian hotel business sector.

Recommendations

From the findings made in this study, the following recommendations are presented for implementation by hotels in Calabar, Cross River State and other hospitality firms in Nigeria:

1. Hotels should maintain an online booking system which enables potential guests to conveniently make reservations, thus freeing them from the stress and costs of physically visiting the business premises.
2. Self-service check-in kiosk technologies should be installed by hotels to facilitate seamless check-ins and check-outs by guests. This will enable a guest to personally and conveniently check into a hotel without the assistance of hotel employees. These undoubtedly shall create a positive perception in guests' minds about the quality of hotel services and enhance their satisfaction.
3. Smart room service technologies should be adopted by hotels to provide guests with convenient, error-free and satisfactory room service throughout the duration of their stay in order to enhance their satisfaction, convenience and comfort. These technologies shall give guests full control over amenities within the hotels such as lights, electronics, air-conditioning systems, access doors and water systems, which could all be controlled remotely by guests using the appropriate software.

References

Abu-Faleh, P., Muhammad, E. & Ismaila, D. (2020). Service automation and hotel guests' satisfaction: A correlation analysis. *Research Journal of Applied Sciences, Engineering and Technology, 5*(17), 4329-4335.

Agha, S., Alrubaiee, L., & Jamhour, M. (2012). Effect of core competence on competitive advantage and organizational performance. *International Journal of Business and Management*, *7*(1), 192-201

Akihiko, T., Tanakana, R. & Fujita, E. (2018). Service delivery automation and customer satisfaction in Japanese luxury hotels. *Journal of Quality Assurance in Hospitality & Tourism, 21*(5), 499-523.

Bernazzani, S. (2018). What is customer satisfaction? https://blog.hubspot.com/service/what-is-customer-satisfaction

Cobanoglu, C., Berezina, K., Kasavana, M. L., & Erdem, M. (2018). The impact of technology amenities on hotel guest overall satisfaction. *Journal of Quality Assurance in Hospitality & Tourism, 12*(4), 272–288.

Farah, E. & Ashraf, P. (2017). Hotel service automation and guests' satisfaction in the Malaysian hospitality sector. *Journal of Hospitality and Tourism Management, 13*(2), 144-160.

Hamel, G., & Prahalad, C. K. (1990). The core competence of the corporation. *Harvard Business Review*, *68*(3), 79-91

Ivanov, S. H., Webster, C., & Berezina, K. (2017). Adoption of robots and service automation by tourism and hospitality companies. *Revista Turismo & Desenvolvimento*, *27*(28), 1501-1517.

Johannes, P. & Kristoffer, T. (2020). Service delivery innovation and customer satisfaction in the Norwegian hospitality industry. *International Journal of Advanced Engineering, Management and Science, 2*(2), 23-53

Juneja, P. (2019). What is customer satisfaction? *https://www.managementstudyguide.com/customer-satisfaction.htm*.

Kawshala, H. (2017). Theorizing the concept of core competencies: An integrative model beyond identification. *International Journal of Scientific and Research Publications*, *7*(2), 253-256

Kılıçhan, R. & Yılmaz, M. (2020). Artificial intelligence and robotic technologies in tourism and hospitality industry. *ErciyesÜniversitesiSosyalBilimlerEnstitüsüDergisi, 50*, 353-380

Lawal, O. O., Logunleko, A. M., & Olaitan, O. T. (2020). State of affairs in ICT usage in the hospitality industry: A case of hotels in Abeokuta, Ogun State, Nigeria. *Journal of Contemporary Research in Social Sciences, 1*(1), 11-37.

Mattsson, J., & Orfila-Sintes, F. (2018). Hotel innovation and its effect on business performance. *International Journal of Tourism Research*, *16*(4), 388-398.

Melián-González, S., & Bulchand-Gidumal, J. (2016). A model that connects information technology and hotel performance. *Tourism Management*, *53*, 30-37.

Ming, E. & Zhang, X. (2019). Hotel service innovation and guests' satisfaction in Seoul. *International Journal of Hospitality Management, 76*, 111-121.

Ndikubwimana, P. & Lwakabamba, G. (2018). The impact of service delivery automation on customer satisfaction in 5-star hotels in Kigali. *British Journal of Economics, Management & Trade*, *13*(4), 1-11.

Nwakanma, I., Ubani, E., Asiegbu, B. & Nwokonkwo, O. (2014). Factors affecting the adoption of ICT in the hospitality industry in Imo State. *International Journal of Computer Science Issues, 11*, 170-181.

Olugbemi, M. T., Ogungbayi, G. B., &Onasanya, A. S. (2020). Effect of information and communication technology usage on service delivery in hotel industries in Abeokuta Metropolis of Ogun State, Nigeria. *Journal of Humanities, 4*(4), 287-297.

Paul, W., Neil, T., Bendle, E., Phillip, E., & David, J. (2010). *Marketing metrics: The definitive guide to measuring marketing performance (2nd Ed.)*. New Jersey: Pearson Education, Inc.

Prakash, A. & Mohanty, R. (2012). Understanding service quality. *Production Planning and Control, 21*(3), 1-16.

Reis, J., Melão, N., Salvadorinho, J., Soares, B., & Rosete, A. (2020). Service robots in the hospitality industry: The case of Henn-na hotel, Japan. *Technology in Society*, *63*, 101-121.

Robertson, E. (2019). What is customer satisfaction? *https://www.myaccountingcourse.com/accounting-dictionary/customer-satisfaction.*

Rosete, A., Soares, B., Salvadorinho, J., Reis, J., & Amorim, M. (2020). Service robots in the hospitality industry: An exploratory literature review. *ZeitschriftfürTourismuswissenschaft*, *11*(1), 25-43.

Sharma, A., Shin, H., Santa-María, M. J., & Nicolau, J. L. (2021). Hotels' COVID-19 innovation and performance. *Annals of Tourism Research*, *88*, 103-113.

Sotoro, P., Gumilang, D. L. & Xuequn, W. (2020). The impact of artificial intelligence on customer satisfaction and loyalty. *Journal of Hospitality Marketing & Management, 29*(7), 739-756

Wang, R., Cheung, F., Feng, S. & Chongyi, P. (2019). Hotel service automation and customer satisfaction in the Chinese hospitality sector. *Journal of Hospitality Marketing & Management, 29*(7), 739-756.

Willcocks, L. P., & Lacity, M. (2016). *Service automation robots and the future of work*. London: Fenton Publishing.

APPENDIX

RESEARCH QUESTIONNAIRE

This questionnaire comprises two sections: Section A and Section B. Please fill the options to indicate your responses to the statements.

SECTION A:
PERSONAL DATA

Please tick (√) in the boxes provided below to show your responses.

1. Age: (a) 18 – 24 years ( ) (b) 25 – 31 years ( ) (c) 32 – 38 years ( )
   (d) 39 – 45 years ( ) (e) 46 years or above ( )
2. Gender: (a) Male ( ) (b) Female ( )
3. Marital status: (a) Single ( ) (b) Married ( )
4. Educational qualifications: (a) FSLC ( ) (b) SSCE ( )
   (c) NCE/ND/HND/B.Sc. ( ) (d) Post-graduate degree ( )
5. Occupation: (a) Student ( ) (b) Businessman/woman ( ) (c) Public/civil servant ( )

SECTION B
QUESTIONNAIRE STATEMENTS

Please kindly show your responses by ticking (√) the following alternatives:
Strongly agree (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD).

S/N	RESEARCH VARIABLES					
	ONLINE BOOKING	**SA**	**A**	**U**	**D**	**SD**
1	The hotel has an online booking system					
2	Guests can use the hotel's corporate website to make reservations					
3	Guests can pay online for rooms before visiting the hotel					
	SELF-SERVICE CHECK-IN KIOSK	**SA**	**A**	**U**	**D**	**SD**
4	The hotel has an automated self-service check-in kiosk					
5	Guests can personally check into rooms without human assistance					
6	The check-in kiosk makes check-ins easy for guests					
	SMART ROOM SERVICE	**SA**	**A**	**U**	**D**	**SD**
7	Some rooms in the hotel are fitted with smart technologies					
8	Guests can control facilities in the room with remote technologies					
9	Guests can access the hotel room service using remote technologies					
	CUSTOMER SATISFACTION	**SA**	**A**	**U**	**D**	**SD**
10	I regularly patronize hotel services					
11	I am comfortable with hotel services					
12	I will continue patronizing hotel services					