Vol. 15(1), pp. 1-16 January-June 2024
DOI: 10.5897/JHMT2024.0338
Article Number: 202968272178
ISSN 2141-6575

http://www.academicjournals.org/JHMT

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Journal of Hospitality Management and Tourism

Full Length Research Paper

Adoption of online reservation systems (ORS) among star-rated hotels in Accra: A cross-sectional study

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Received 2 April, 2024; Accepted 29 April, 2024

This study was conducted to identify the forms of Online Reservation Systems (ORS) adopted by star-rated hotels in Accra Metropolis, Ghana. A cross-sectional design and questionnaire were used to gather data from 183 reservation/front office managers of the star-rated hotels through a census. Descriptive statistics, Chi-square test of independence, Factor analysis, and Binary logistic regression were used for the analysis. The study revealed that the majority of the star-rated hotels (87%) in Accra Metropolis have adopted ORS with Online Travel Agents and Hotel's website being the most popular forms of reservation systems used. Technological, managerial, economic, and environmental factors emerged as the factors which influenced the adoption of ORS. It was also observed that hotels maximized reservations, and had their business open to the public always. The study further found that slow internet access, lack of qualified personnel, high commission rates, and lack of interaction between personnel and clients were the main barriers to the use of ORS. In as much as the adoption of ORS is beneficial, hotels are faced with several obstacles that prevent them from maximizing utilization of the ORS facilities. The study was restricted to only star-rated hotels in the Accra Metropolis. The knowledge advanced in this study will inform hospitality facility owners and practitioners about the factors underlying the adoption of ORS in the Accra Metropolitan zone. The outcome of this study provides hospitality policymakers, academicians, and stakeholders in hospitality development with relevant information on ORS adoption among star-rated hotels in the Accra Metropolis towards its development. This is vital since ORS adoption impacts the sustainability of the hotel industry and provides information that will serve as a baseline for further studies on ORS adoption in other categories of hotels and locations. The uniqueness of this study lies in the adaption of the Tornatzky and Fleischer model on the Technology-Organization-Environment to elicit the underpinnings of the adoption of ORS in a developing country like Ghana.

Key words: Online reservation systems, hotels, hotel's own website, hospitality industry.

INTRODUCTION

The surge in demand for online reservation services (ORS) has become increasingly evident in the hospitality industry, with consumers either visiting online platforms directly or utilizing search engines to access vendor sites

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(Pilepic et al., 2015; Shasha, 2016). Many online travel agents (OTAs) have responded by offering consumers online reservation facilities, aiming to provide flexible booking options (Law et al., 2009). ORS, which includes online booking, presents an ideal platform for tourists to plan their trips and make reservations regardless of their geographical location (Buhalis and Law, 2008). These advancements have stimulated innovations in travel destination software and reservation systems (Law et al., 2009). Consequently, approximately 80% of travelers acquire information about hotel rooms from various websites, with 67% opting to book accommodations online (Toh et al., 2011).

In the 1990s, Ghanaian hospitality companies primarily relied on manual procedures for handling bookings, guest services, and back-office tasks. Bookings and communication were managed using outdated technology such as fax machines and landlines (Asabere et al., 2014). Limited Internet access during this period restricted opportunities for online reservations and bookings. With the introduction of the Internet and increasing globalization, basic technologies like email communication and modest websites began to emerge in Ghana's hospitality sector. From the early 2000s, a few hotels and restaurants have adopted basic property management systems (PMS) to handle bookings and visitor data (Akyeramfo-Sam and Nti, 2017).

The surge in the adoption of ORS has attracted considerable attention from researchers exploring various dimensions of its adoption. However, the majority of these studies have primarily focused on the customers' perspective. For instance, Kurn et al. (2004) investigated the impact of relationship orientation on customers' room reservation, while Lee et al. (2005) examined users' perspectives of reservation systems. Similarly, Elhaji (2012) explored factors influencing consumers' perceptions of online and traditional travel reservation systems, and Mc Carthy et al. (2010) delved into travelers' utilization of online and social media channels in selecting a hotel. Some scholars have also explored consumers' perceptions of online versus traditional flight reservation methods (Elhaji, 2012) and online customer experience and repurchase intention (Liu et al., 2016).

As far as our extensive search revealed, the only study in Ghana that considered organizational perspectives focused on the impact of ORS on hotel businesses, and this study was conducted over a decade ago (Lin and Lin, 2009). In the context of online reservation systems, the Technology Acceptance Model (TAM) may consider additional elements including interoperability with current systems, platform security and trustworthiness, and social influence from rivals or peers in the sector (Tan and Sundarakani, 2021). For example, hotels may consider how well a reservation system integrates with their property management system or whether it has robust security measures in place to protect client information. Hotels are likely to adopt online reservation systems if they perceive that they will help them operate more efficiently and provide better experiences for their guests. These platforms improve booking accuracy, reduce administrative tasks, streamline the booking process, and provide valuable data for informed decision-making (Su et al., 2022).

Another theory relevant to the study is the Innovation Diffusion Theory (IDT), which offers insights into how innovations such as online reservation systems spread throughout enterprises and the various factors that influence the adoption process (Gu et al., 2019). IDT serves as a useful framework for understanding how hotels implement online reservation systems.

Most studies on ORS have originated from Western countries such as the United Kingdom (Lin and Lee, 2009), the United States (Huang et al., 2020), China (Li et al., 2017), Malaysia (Omar et al., 2020), and Romania (Agheorghiesei and Ineson, 2011). These studies generally suggest that ORS is associated with numerous benefits, enhances positive customer experiences, and fosters loyalty. However, there exists a significant knowledge gap regarding ORS adoption from the perspective of developing countries like Ghana. Limited understanding exists about the dynamics of ORS adoption among star-rated hotels in Ghana, including the capital city of Accra.

Therefore, it is crucial to comprehend the dynamics of ORS adoption among Ghana's star-rated hotels, particularly considering the technological landscape in Ghana and the hotel industry's context (Bamile et al., 2014; Akaba, 2015; Issahaku, 2012; Boakye, 2011).

This study aims to investigate the adoption of ORS by star-rated hotels in Accra, the capital of Ghana. The findings of this study are expected to address an essential knowledge gap in the hospitality industry and offer practical interventions to help the sector leverage the full benefits and potentials of ORS. The study is guided by the following research questions: (1) what factors influence the adoption of ORS among star-rated hotels in the Accra Metropolis? (2) what are the challenges associated with the use of ORS among star-rated hotels in the Accra Metropolis?

LITERATURE REVIEW

Online reservation systems (ORS)

An ORS is a software application utilized for the convenient booking of services, accommodations, or resources over the Internet. Commonly employed in diverse industries such as hospitality, travel, tourism, and event management, an ORS streamlines the process of making reservations and appointments. It provides a user-friendly interface enabling customers to view availability, select their preferences, and confirm reservations without requiring direct human interaction.

Theories underpinning adoption of online reservation systems by hotels

It is possible to describe and comprehend the adoption of ORS by hotels using a variety of theoretical frameworks that encompass both technological and commercial aspects. The following are some significant theories that support hotels' use of ORS:

Technology Acceptance Model (TAM)

The Technology Acceptance Model is frequently employed to understand how people come to accept and use technology. The Technology Acceptance Model highlights perceived utility and simplicity of use as major determinants of technology adoption. According to this idea, adoption of ORS in hotels is more likely if the system is perceived as advantageous and simple to use by both hotel personnel and guests (Kamal et al., 2020).

Innovation diffusion theory

This theory focuses on how individuals within a social system gradually share innovations over time. It may be used to explain why hotels adopted ORS as it emphasizes the variables affecting the speed of technology adoption, including the relative advantage of the innovation, compatibility with current practices, complexity, and trialability (Wani and Ali, 2015).

Unified theory of acceptance and use of technology (UTAUT)

To understand how technology is accepted and used, the UTAUT combines components from various technology acceptance models. It considers performance expectancy, effort expectancy, social influence, and enabling circumstances as important factors influencing user intents and actions. These variables may impact the adoption of ORS by hotels as they represent how helpful, simple, and supported the system is perceived by the public (Momani, 2020).

Resource-based view (RBV) theory

According to the RBV hypothesis, a company's internal resources and capabilities play a major role in determining its performance. This theory emphasizes the value of a system as a resource that may enhance a hotel's ability to serve clients effectively, manage bookings efficiently, and enhance overall operational performance in the context of ORS adoption by hotels (Gupta et al., 2018).

Institutional theory

This theory places a strong emphasis on institutional factors, such as normative, regulatory, and cultural influences, in influencing organizational behavior. It proposes that the pressure to adhere to industry standards and best practices, as well as the impact of competitive factors, might drive hotels to implement ORS to remain competitive and meet consumer expectations in the context of ORS adoption by hotels (Soares et al., 2021).

Empirical studies

Faliha et al. (2021) investigated the relationship between online reservation systems and online customer reviews. Their study incorporates a literature review of relevant previous studies. They found that the online reservation system significantly influences trust, brand image, and hotel booking decisions. Factors such as price, trust, brand image, convenience, and food quality were identified as having a significant impact on online hotel booking intentions. The study emphasizes the importance of digital marketing strategies, including these two components, in enhancing customer relationships and guiding customers in their booking decisions. Overall, the findings support the significance of utilizing online reservation systems and online customer reviews to attract and retain customers in the increasingly digitalized hospitality industry.

Folalu (2019) investigated the impact of information and communication technology (ICT) on qualitative service delivery in the hospitality industry. This study focused on the utilization of technological facilities in selected hotels in Abeokuta, Nigeria, aiming to assess their effectiveness and efficiency in improving customer service, reducing operational costs, increasing awareness, and enhancing patronage rates. The research design employed was cross-sectional and descriptive, with primary data collected through a questionnaire. Using a simple random sampling technique, 102 respondents were selected from five chosen hotels in Abeokuta, Nigeria. Data analysis utilized descriptive statistics, including frequencies and chi-square analysis. The study found that the availability of technological facilities within selected hotels significantly improved qualitative service delivery, leading to increased patronage rates, reduced operational costs, improved customer service, and heightened awareness of technological facility usage. Chi-square analysis revealed a significant relationship between respondents' attitudes and technology deployment. The study concludes that ICT positively impacts guest experience and recommends ensuring the effectiveness, adequacy, and efficiency of technological facilities, as well as regular maintenance.

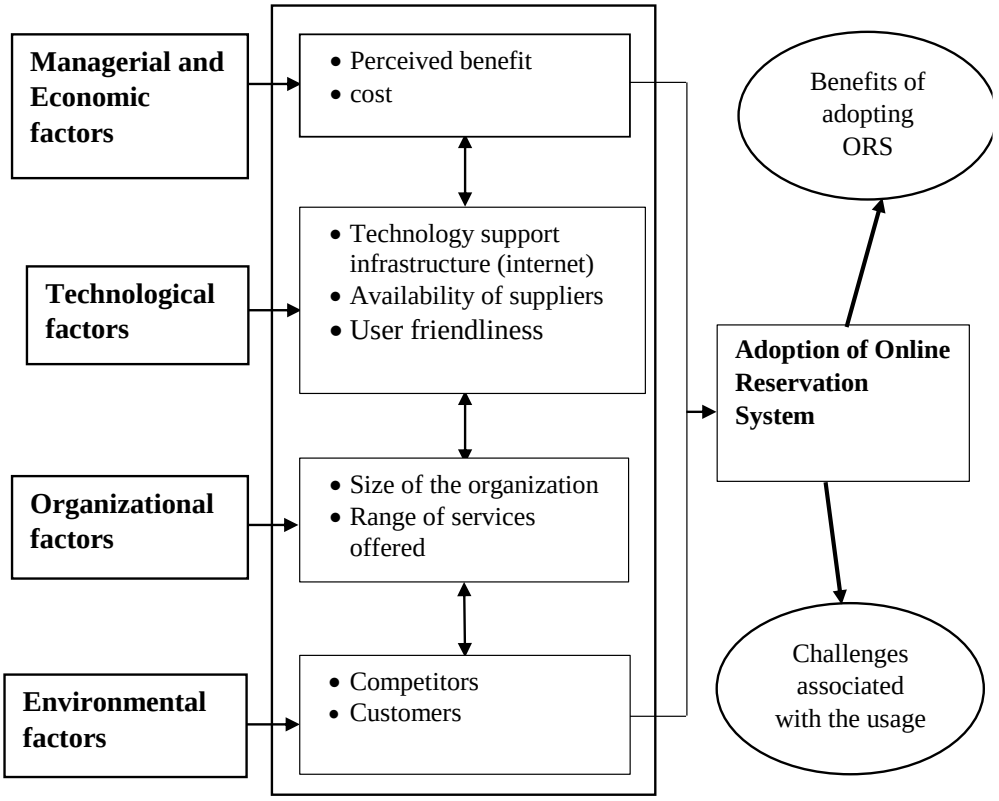

Figure 1. Conceptual framework of online reservation system.
Source: Adapted from Tornatzky and Fleischer (1990).

Akyeampong and Nutsugbodo (2017) investigated the extent to which hotels in the Brong-Ahafo region have adopted information and communication technologies (ICTs) in their business operations. Using a sample of 79 hotels, data were collected through a questionnaire survey. The study revealed that only high-grade hotels utilized industry-oriented ICTs such as online reservation and property management systems.

Kim et al. (2017) also examined the effects of perceived value, website trust, and hotel trust on online hotel booking intention. Survey data were collected from 307 individuals with prior experience in making reservations using third-party online booking sites. The study found that an online reservation system managed by a third party significantly impacts hotel booking decisions.

Conceptual framework

The conceptual framework of this study was adapted from Tornatzky and Fleischer (1990) model of Technology-Organization-Environment. According to the model, the influencers of an organization's adoption of ORS are due to an interaction between four major constructs: Managerial and Economic, Technological, Organizational, and Environmental factors. As depicted in Figure 1, Managerial and Economic factors encompass the cost and perceived benefits derived from the adoption of ORS. Technological factors include the technological competencies of the hotel, the availability of technology suppliers and support infrastructure, and the cost of installing and maintaining technological equipment. Organizational factors reflect variables such as the number of hotel rooms, the range of services offered, and the type of clients targeted.

These factors influence hotels' decisions to adopt a technology like ORS. The environmental factors in this study refer to the setting in which the hotel operates and conducts its business activities.

This may encompass both micro and macro issues (Cetindamar, 2001). Once a hotel adopts ORS, it stands the chance to gain some benefits and face some challenges in the usage of the technology.

METHODOLOGY

Study area

The study was conducted in the Accra Metropolis, located in the Greater Accra Region of Ghana (Figure 2). The specific study sites included Accra Central, Airport Residential, East Legon, Osu,

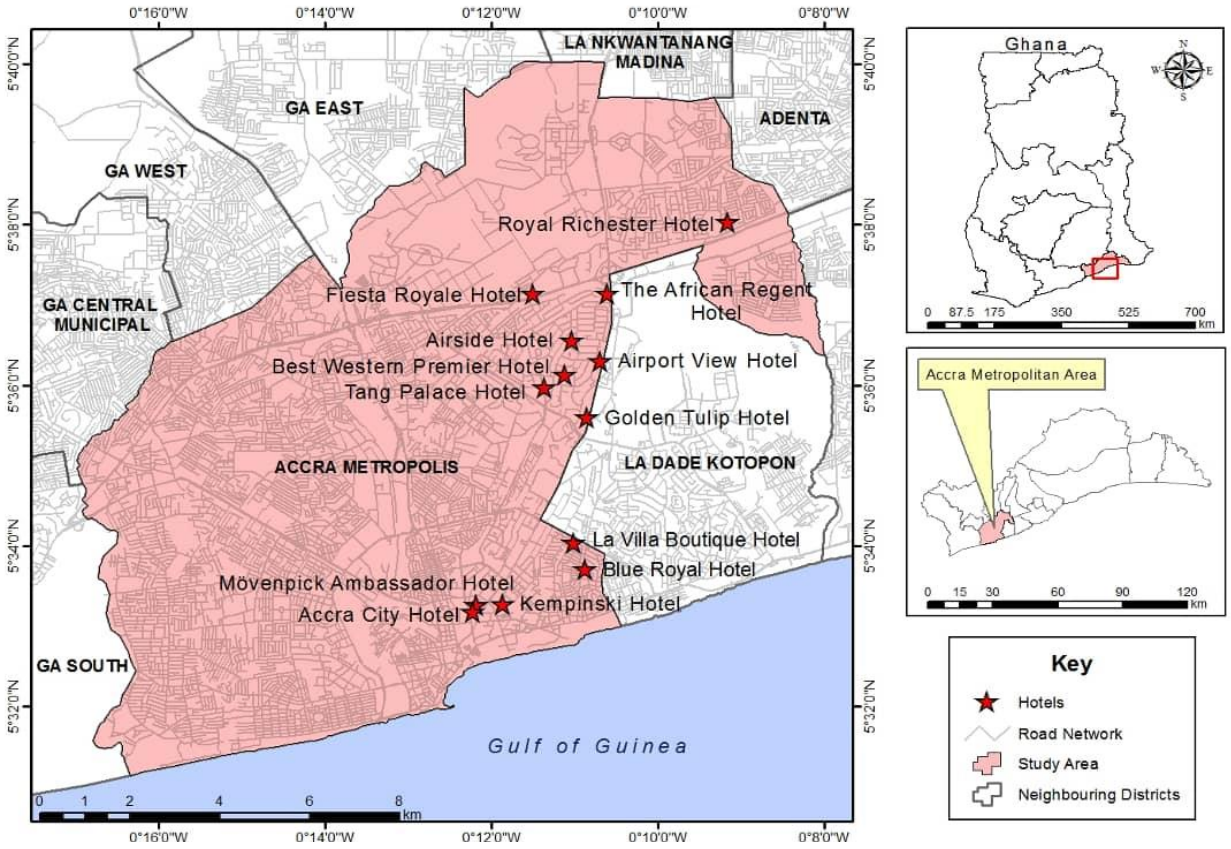

Figure 2. Map of Accra metropolis.
Source: Cartographic Unit, Department of Geography and Regional Planning, University of Cape Coast (2017).

Dzorwulu, and Tesano. These areas were chosen because they have the highest concentration of star-rated hotels within the hotels. Firstly, the Metropolis hosts a multitude of hotels, ranging from internationally owned (hotel chains) such as Holiday Inn, Movenpick, Marriott, and Novotel Hotel (Ayeh, 2007). Many of these hotels rely on online reservation systems to facilitate booking for their international clientele. In addition to the activities of international hotels, there is a diverse array of local and independently owned hotels, rated from five stars to non-star rated, competing with internationally recognized hotels.

This diverse mix provides an ideal environment for investigating the adoption of online reservations by a cross-section of hotels within the Metropolis. Secondly, the Metropolis is home to all major telecommunication companies providing internet services in Ghana, which are crucial for the sustenance of any business, including online reservation systems (Ofori-Atta, 2015). This creates a conducive environment for online reservation services. Moreover, Accra hosts numerous multilateral, bilateral, and regional organizations such as the United Nations Country Office, World Bank, African Development Bank, UNICEF, FAO, and various embassies (Amankwah-Amoah et al., 2018). These institutions receive international guests and often rely on online reservations for their hotel bookings (Osei-Tutu et al., 2010).

Research design

The study adopted a cross-sectional design, which is the most common research design for social science research. This design involves determining the research objectives, identifying the population, selecting a sample or using the entire population, and reaching out to respondents to collect the required information (Kumar, 2005). This research focuses specifically on a cross-section of hotels, namely star-rated hotels.

Study population

The study population consisted of all reservation/front office managers of 1-5 star rated hotels in the aforementioned locations within the Accra Metropolis at the time of data collection. Reservation/front office managers were targeted for the study because they are expected to have a comprehensive understanding of their organization, particularly regarding ORS. They are typically responsible for the strategic development of hotels, including the alignment of information and communication technology (ICT) with business strategies (Pirnar, 2014).

Additionally, front office/reservations managers often collaborate with front-line employees to gather daily feedback on guests' complaints and requests.

Sample and sampling techniques

All 1-5 star rated hotels in the locations mentioned under the study area section were included. Hotel category was determined by the

Accra Metropolis. Accra possesses unique features and characteristics that facilitate the adoption and use of online reservation systems by

Table 1. Profile of star-rated hotels in the Accra metropolis.

Hotel category	Number of hotels
1 star	76
2 star	84
3 star	13
4 star	7
5 star	3
Total	183

Source: GTA (2015).

number of stars acquired, reflecting the facilities and services offered by the hotel. A census approach was employed due to the relatively low number of star-rated hotels within the study area. This sampling technique ensures the inclusion of every individual in the population, minimizing sampling error and providing the highest level of accuracy and precision in the collected data. Data collected through the census method assists in studying a problem with a higher degree of accuracy (Kothari, 2004). In total, there were one hundred and ninety-three (193) hotels; however, ten hotels declined to participate in the survey, citing lack of perceived benefit from previous studies conducted by students and institutions. Out of the 183 questionnaires administered (Table 1), one hundred and seventy-two were retrieved from the field, resulting in a response rate of 89.9% for the study.

Data collection instrument

A questionnaire was used for data collection as it allows reaching many respondents within a short time (Creswell, 2005). The questionnaire was designed and administered in English, the official language of Ghana, as the managers are proficient in reading, writing, and understanding English. The questionnaire comprised closed-ended questions utilizing a 4-point Likert scale ranging from strongly agree to strongly disagree. It covered factors influencing the adoption of ORS among star-rated hotels in the Accra Metropolis, as well as challenges associated with ORS usage. The instrument underwent pre-testing among hotels in the Cape Coast Metropolis, involving twenty star-rated hotels over four days in January 2018. Cape Coast was chosen for pre-testing due to its considerable number of star-rated hotels, many of which utilize ORS due to increased competition. The purpose of pre-testing was to validate the instrument and refine the questionnaire. It was revised by reviewing the wording and adjusting or re-writing items to reduce ambiguity based on the reviewed literature.

Data processing and analysis

The data were meticulously checked for completeness, edited, and, if necessary, recoded before being utilized. Subsequently, the data was inputted into the Statistical Package for Service Solutions (SPSS) version 22 for further analysis. Descriptive statistics, including means, standard deviations, frequencies, percentages, and cross-tabulation, were employed to describe the sample characteristics of the hotels. The Chi-square test of independence was utilized to analyze the relationship between various forms of ORS and hotel characteristics. Factor analysis was conducted to identify the underlying structure of factors influencing the adoption of ORS among hotels in the Accra Metropolis. Additionally, Binary logistic regression was employed to ascertain the factors influencing hotels' adoption of different forms of ORS.

Ethical consideration

The entire protocol for the study received approval from the Ethical Review Board of the University of Cape Coast. Informed consent was obtained from all respondents before commencing the research. Providing adequate information about the study was crucial to enable participants to make an informed decision about their participation. An introductory letter from the Department of Hospitality and Tourism Management, University of Cape Coast, was utilized to seek consent from the respondents. All participant information was treated with strict confidentiality and anonymized to safeguard their privacy. Data collected were coded, and personal identifiers were removed to ensure anonymity. Access to the data was restricted to only the research team, and it was securely stored.

RESULTS

Hotel characteristics

The results presented in Table 2 indicate that the majority (86.6%) of the hotels were categorized as either 1 or 2-star rated accommodations in Ghana. Only a small proportion were classified as 4 or 5-star rated hotels (4.1 and 1.7% respectively). Additionally, less than a quarter (23.3%) of the hotels had commenced operations within the past 5 years, while approximately 3 out of every 10 hotels had been in business for between 6 and 10 years (30.8%). About 46% of the hotels had been in existence for at least 11 years. In terms of ownership structure, more than four out of every five hotels were independently owned, while 17.4% were chain hotels. Furthermore, more than a third (34.2%) of the hotels had a room capacity ranging from 21 to 40. Hotels with at most 20 rooms accounted for 32.4% of the total, while those with 61 to 80 rooms constituted 7.0%. Moreover, over half (58.5%) of the hotels charged below GHS500.00 ($82.0) per night, with only 7.6% charging room rates above GHS1000.00 ($165.0).

Hotels with room rates below GHS500.00 ($82.0) typically have smaller accommodation facilities and often rely on family members for employment and self-maintenance rather than hiring outside experts. Additionally, these hotels tend to have limited advertising. On the other hand, hotels with room rates exceeding GHS1000.00 ($165.0) are upscale establishments, typically ranging from 3 to 5-star facilities, which are required by regulations to provide additional amenities such as a forex bureau and upscale dining areas, among others. Regarding hotel services, food and beverage offerings were predominant (30.8%), followed by conference services (27.4%), with 17.4% providing airport pickup services out of the total services offered by the hotels. Furthermore, 31.4% of the hotels had swimming pools, 14.5% operated forex bureau facilities, and 5.2% had convenience shops.

Table 2. Hotel characteristics (N= 172).

Characteristics	Frequency	%
Hotel category		
1 star	70	40.7
2 star	79	45.9
3 star	13	8.0
4 star	7	4.1
5 star	3	1.7
Age of hotel		
<5 years	40	23.3
6-10 years	53	30.8
11-15 years	31	18.0
16-20 years	30	17.4
21-25 years	18	10.5
Ownership structure		
Chain	30	17.4
Individual	142	82.6
Numbers of rooms		
< 20	56	32.4
21-40	59	34.1
41-60	22	12.7
61-80	15	8.7
> 80	20	11.6
Room rate (GHC)		
<500	96	55.8
501-1000	45	26.2
1001-1500	13	7.6
>1501	17	9.8
Hotel services		
Food and Beverage	172	30.8
Conferences	153	27.4
Laundry	135	24.2
Airport pickup services	99	17.7
Facilities		
Swimming pool	54	31.4
Gym	10	5.8
Convenience Shop	9	5.2
Forex bureau	25	14.5

Source: Field Survey (2018).

Adoption of ORS by star-rated hotels in the Accra metropolis

From Figure 3, the results indicate that more than three-quarters (78%) of the hotels had adopted ORS, while less than a third (22%) had not adopted the reservation systems.

Hotel characteristics by forms of ORS

Evidence from Table 3 suggests a statistically significant relationship between hotel category and the hotel's website (HOW) (χ^2=14.291; p=0.006). All 4 and 5-star hotels (100.0%) utilized their own websites, while only

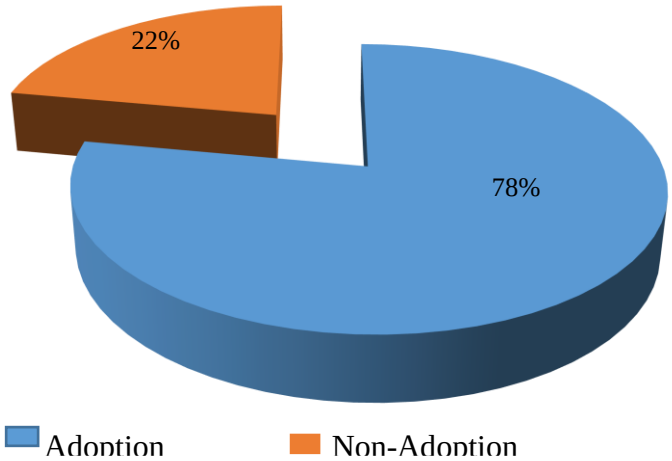

Figure 3. Adoption of online reservation systems.
Source: Field Survey (2018).

about 55.4% of 1-star hotels were using hotel-owned websites. Similarly, there was a significant association between hotel category and OTAs (χ^2=32.683; p=0.000). All 4 and 5-star hotels were utilizing OTAs, whereas less than half (46.2%) of 1-star hotels were using OTAs. Additionally, a significant association was observed between hotel category and Global Distribution Systems (GDS) (χ^2=61.969; p=0.000). The results further indicate that while all (100%) of the 4-star hotels used GDS, 93.8 and 93.2% of 1 and 2-star hotels, respectively, were not using GDS.

Structure of factors underlying the adoption of ORS

The first factor (I) measured issues related to managerial and economic dimensions, consisting of 4 items (Table 4). This factor had an eigenvalue of 4.11, which accounts for 22.89% of the total variance. Among the items under managerial and economic factors, management support recorded the highest loading (0.784), while commission rate and feedback from customers had the lowest factor loadings (0.750). Out of the nine factors used to measure the managerial and economic factors, only four significantly contributed to the construct.

The second factor (II) measured technological issues influencing the adoption of ORS. In total, 3 items significantly contributed to this model. The technological factor had the highest eigenvalue of 4.91, representing 19.59% of the total variance. Among the items, failure of systems or providers had the highest loading (0.751), followed by the type of technological equipment (0.729), while integrating ORS with existing systems showed the lowest factor loading (0.711).

Factor three (III) captured issues related to organizational factors, consisting of only 2 items. These accounted for an eigenvalue of 2.58, contributing 21.41% of the total variance. The type of clients targeted had the highest factor loading (0.873), while the range of services offered had the lowest (0.781).

The last factor (IV) measured variables related to environmental factors, also comprising 2 items. This factor accounted for an eigenvalue of 2.71, equivalent to 13.39% of the total variance. Specifically, customer readiness to use new technology had the highest factor loading (0.886), while customer trust in the new technology had the lowest factor loading (0.804).

Binary logistics regression of factors associated with forms of ORS

The results obtained include the Wald statistics, Odds ratios, p-values, and confidence intervals. Table 5 illustrates the extent to which factors associated with the adoption of ORS influence different forms of ORS. Three models emerged from the analysis: the first model showed how factors influenced the adoption of Hotel-Owned Websites (HOWs), the second model examined factors influencing the adoption of OTAs, and the third model explored factors affecting the adoption of Global Distribution Systems (GDS).

The first model was found to be a good predictor of the adoption of HOWs, as indicated by the Hosmer and Lemeshow Test (χ2 = 7.209; p = 0.514). The model predicted 70.0% of the use of HOWs, as demonstrated by the Nagelkerke R2 of 0.702. However, despite the significance of the model in predicting the use of the hotel's own website, not all predictors were significant.

Three out of the four factors were found to be significant. Specifically, managerial and economic (Wald = 8.225), technological (Wald = 6.749), and environmental (Wald = 10.550) factors were found to have a statistically significant influence on the adoption

Table 3. Hotel characteristics by forms of online reservation system.

Characteristic	HOWs		x^2	p-value	OTAs		x^2	p-value	GDS		x^2	p-value
	%Yes	%No			%Yes	%No			%Yes	%No		
Hotel category			14.291	0.006*			32.683	0.000*			61.969	0.000*
1 star	55.4	44.6			46.2	53.8			6.2	93.8		
2 star	73.0	27.0			79.7	20.3			6.8	93.2		
3 star	87.0	13.0			95.7	4.3			39.1	60.9		
4 star	100	0.0			100	0.0			100	0.0		
5 star	100	00			100	0.0			66.7	33.3		
Age of hotel			15.030	0.005*			1.980	0.018*			7.829	0.098
<5	87.5	12.5			90.0	10.0			22.5	77.5		
5-10	56.6	43.4			62.3	37.7			17.0	83.0		
11-15	58.1	41.9			58.1	41.9			3.2	96.8		
16-20	83.8	16.7			66.7	33.3			10.0	90.0		
21-25	66.3	33.3			77.8	22.2			27.8	72.2		
Ownership structure			0.784	0.376			2.959	0.085			7.108	0.008*
Chain	76.7	23.3			86.7	13.3			33.3	66.7		
Individual	68.3	31.7			71.2	28.8			12.5	72.2		
Number of rooms			23.963	0.000*			22.029	0.000*			46.944	0.000*
<20	48.2	51.8			48.2	51.8			1.8	98.2		
21-40	71.2	28.8			76.3	23.7			8.5	91.5		
41-60	86.4	13.6			81.8	18.2			40.0	60.0		
61-80	100	0.0			80.0	20.0			60.0	40.0		
>80	85.0	15.0			90.0	5.0						
Room rate			17.343	0.002*			34.700	0.000*			69.036	0.000*
<500	58.3	41.7			52.1	47.9			4.2	95.8		
501-1000	83.0	17.0			91.5	8.5			12.8	87.2		
1001-1500	63.6	36.4			90.9	9.1			18.2	81.8		
>1501	100	0.0			100	0.0			75.0	25.0		

Source: Field Survey (2018).
*Significant at p< 0.050.

of Hotel-Owned Websites (HOWs). Nonetheless, organizational factors did not have a significant influence on the adoption of HOWs. The findings from the odds ratio showed that managers who agreed on the managerial and economic factors were more than 4 times (Odds = 4.308) likely to

Table 4. Structure of factors underlying the adoption of ORS.

Variables included in the factor	Loadings	Eigenvalues	% of variance explained	Cronbach's alpha
I Managerial and economic				
Management support	0.784			
Cost of technological equipment	0.772	4.11	22.89	0.807
Commission rates	0.750			
Feedback from customers	0.750			
II Technological				
Failure of systems or providers	0.751			
Technological equipment	0.729	4.91	19.59	0.737
Integrating ORS with existing systems	0.711			
III Organizational				
Type of clients targeted	0.873	2. 58	21.41	0.659
Range of services offered	0.781			
IV Environmental				
Customer readiness to usenew technology	0.886	2.71	13.39	0.717
Customers trust in the new technology	0.804			
Total		14.31	77.28	

Bartlett's Test of Sphericity =1654.601, Significance = 0.000, Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.800.
Source: Field Survey (2018).

Table 5. Logistic regression of factors influencing adoption by forms of ORS.

Independent variable (factors)	Wald	Odds	P-value	95% CI For EXP (B)	
				Lower	Upper
		Hotels' own website			
Managerial and economics					
Agree	8.255*	4.308	0.004	1.591	11.665
Disagree (RC)	1.0				
Technological					
Agree	6.749*	4.569	0.009	1.452	14.374
Disagree	1.0				
Organizational					
Agree	2.027	2.125	0.155	.753	5.998
Disagree	1.0				
Environmental					
Agree	10.550*	3.552	0.001	1.653	7.632
Disagree	1.0				
Nagelkerke R^2 0.702					
		Online travel agents			
Managerial and economics					
Agree	12.457*	7.230	0.0001	2.410	21.688
Disagree (RC)	1.0				

Table 5. Contd.

Technological					
Agree	4.203*	3.259	0.040	1.053	10.086
Disagree	1.0				
Organizational					
Agree	8.262*	5.649	0.004	1.735	18.399
Disagree	1.0				
Environmental					
Agree	5.102*	2.382	0.024	1.122	5.058
Disagree	1.0				
Nagelkerke R^2 0.739					
		Global Distribution Systems (GDS)			
	Wald	**Odds**	**Sig.**	**Lower**	**Upper**
Managerial and economics					
Agree	0.017	1.088	0.897	0.302	3.923
Disagree (RC)	1.0				
Technological					
Agree	5.677*	5.153	0.017	1.338	19.853
Disagree	1.0				
Organizational					
Agree	2.027	1.954	0.247	0.628	6.079
Disagree	1.0				
Environmental					
Agree	2.696	2.270	0.101	0.853	6.041
Disagree	1.0				
Nagelkerke R^2 0.289					

*Significant at p< 0.050.
Source: Field Survey, Ankor (2018).

adopt HOWs compared to those managers who disagreed with managerial and economic factors as being influential factors on ORS adoption. Respondents who agreed that technological factors will influence ORS were 4.6 times (Odds = 4.569) more likely to adopt a website for their facility compared to their counterparts who disagreed. Respondents who agreed on environmental factors were 3.6 times (Odds = 3.55) more likely to adopt the hotel's website.

The second model on the adoption of OTAs, as evident in Table 5, proved to be a predictor as indicated by the Hosmer and Lemeshow Test (χ^2 = 11.696; p = 0.165). The model predicted about 74.0% of the variances in the adoption of OTAs by the hotel facilities, as shown by the Nagelkerke R2 of 0.739. All the predictors were significant in predicting the adoption of OTAs. Respondents who agreed on managerial and economic factors were 7.2 times (Odds = 7.230) more likely to adopt OTAs for their hotel. Similarly, those who agreed that technological factors can influence OTAs were 3.3 times (Odds = 3.259) more likely to adopt and use them than those who did not agree. Likewise, managers who agreed that organizational factors influenced OTAs were 5.6 times (Odds = 5.649) more likely to adopt OTAs for their facility. Managers who agreed on environmental factors were 2.4 times (Odds = 2.382) more likely to adopt OTAs.

Furthermore, concerning predicting how the factors influenced the adoption of Global Distribution Systems (GDS), variables in the model also proved to be good predictors of the adoption of GDS, as indicated by the Hosmer and Lemeshow Test (χ^2 = 11.809; p = 0.160). The model predicted approximately 29% of the variances in the outcome variable, as shown by the Nagelkerke R2

Table 6. Challenges by forms of online reservation systems.

Forms	Challenges of using online reservation systems																	
	Slow access time of internet		Cancellation of booking		Inexperience		Unqualified staff		Internet Instability		Cost of maintenance		High ommission rates		Less interaction with guests		Lack of hotel-client relationship	
	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)	A (χ^2)	D (p)
Agreement	63.3	36.7	72.1	27.9	71.2	28.8	51.1	48.9	76.1	23.9	75.6	24.4	87.5	12.5	82.7	17.3	84.2	15.8
HOWs	5.564	0.135	1.305	0.728	8.070	0.045*	12.305	0.006*	16.494	0.001*	16.770	0.001*	29.560	0.068	7.450	0.094	5.897	0.064
OTAs	10.065	0.018*	5.103	0.164	7.97	0.050	12.798	0.005*	10.239	0.017*	8.805	0.032*	4.895	0.000*	23.895	0.021*	21.655	0.021*
GDS	8.826	0.055	1.715	0.634	1.618	0.655	2.564	0.464	3.048	0.348	5.546	0.136	2.598	0.543	3.986	0.475	3.675	0.601

Source: Field survey, Ankor (2018).
*Significant at p< 0.050.

of 0.289.

Regarding the predictive power of the model, only technological factors showed a significant influence (Wald = 5.677) on the adoption of GDS. Specifically, managers who agreed that technological factors influenced the adoption of GDS were 5 times (Odds = 5.153) more likely to adopt GDS. However, the remaining factors (managerial and economic, organizational, and environmental) were not statistically significant in predicting their effects on GDS adoption.

Challenges by forms of online reservation systems

As shown in Table 6, there was a significant relationship between some of the challenges associated with using Online Reservation Systems (ORS) and Hotel-Owned Websites (HOWs) at $p \leq 0.05$. Specifically, there was a statistically significant relationship between unqualified staff and HOWs ($\chi^2 = 12.305$; $p = 0.006$). Further analysis indicated that 51.1% of hotels agreed that having unqualified personnel is one of the challenges associated with using HOWs, while 48.9% disagreed. It's not surprising that a majority of hotels identify with this challenge, as using an online system requires competency and technical know-how.

Similarly, a significant relationship existed between the instability of the internet and HOWs ($\chi^2 = 16.494$; $p = 0.001$). The results showed that 76.1% of hotels agreed to face the challenge of internet instability when using their own website, while 23.9% disagreed. Additionally, there was a statistically significant relationship between the cost of maintenance and HOWs ($\chi^2 = 16.770$; $p = 0.001$). The findings revealed that 75.6% of hotels agreed that the cost of maintenance is a challenge associated with using a hotel's own website, while less than a quarter (24.4%) disagreed.

Table 6 further revealed a significant relationship between the challenges associated with using ORS and OTAs at $p \leq 0.05$. Specifically, a significant relationship was found between internet speed and the use of OTAs ($\chi^2 = 10.065$; $p = 0.018$). The analysis showed that 63.3% of hotels agreed that slow internet access is a challenge associated with the use of OTAs, while 36.7% disagreed. Moreover, there was a significant relationship between unqualified staff and OTAs ($\chi^2 = 12.798$; $p = 0.005$). The study revealed that about 51.1% of hotels agreed to have a challenge in terms of unqualified staff using OTAs compared to 48.9% who disagreed. Additionally, a significant relationship was found between internet instability and OTAs ($\chi^2 = 10.239$; $p = 0.017$). The analysis showed that 76.1% of hotels agreed that internet instability affects their use of OTAs, while 23.9% disagreed.

DISCUSSION

Following the knowledge gap in Online Reservation System (ORS) adoption in Ghana, this study aimed to investigate the adoption of ORS by star-rated hotels in the capital city of Ghana, Accra. The study revealed that nearly eight out of ten hotels had adopted ORS (78%), indicating a significant proportion of hotels have integrated ORS into their operations. Notably, 23.3% of the hotels commenced business less than 5 years ago, suggesting that newer hotels are likely to adopt ORS over time to streamline their operations.

A plethora of literature has indicated that the adoption of ORS depends on several factors, with

merits often outweighing demerits (Agag and El-Masry, 2016; Elhaj, 2012; Ayeh, 2007). Despite initial hesitancy, hotels have made efforts to enhance their electronic distribution in recent years (Law and Jogaratnam, 2005). This finding aligns with the notion that hotels are incorporating new technologies to meet evolving customer needs (Berezina et al., 2016), reflecting awareness of technology's merits in operations as advocated by the Technology-Organization-Environment model (Tornatzky and Fleischer, 1990).

Moreover, the increasing popularity of Internet services such as ORS makes it convenient for travelers to search for information and make travel arrangements online (Li and Law, 2007; Baum, 2002). This trend implies that all customer segments will likely utilize online booking systems in the future, making ORS inevitable (Kelly, 2017). The high usage of Hotel-Owned Websites (HOWs) by upscale facilities may stem from its cost-effectiveness, personalized online distribution platform, and ability to enhance brand values and customer loyalty (Law and Hsu, 2006; Agag and El-Masry, 2016).

All the 4 and 5-star hotels were using OTAs, while less than half of 1-star hotels (46.2%) utilized OTAs. This dominance of OTA usage among high-star-rated hotels suggests that hotels with at least four stars are better equipped to leverage OTA services. These high-star-rated hotels likely possess experienced management and a competitive economic advantage, affirming the critical role of effective management and economic factors as outlined in the conceptual framework (Tornatzky and Fleischer, 1990). This finding aligns with Daghfous and Barkhi (2009), who suggested that higher-rated hotels tend to adopt and use technologies more than lower-grade hotels.

Many hotels agreed that a reduction in sales staff and wider coverage were benefits associated with using Hotel-Owned Websites (HOWs). This observation implies that employing limited staff could lead to cost reductions, particularly in salaries. Effective use of HOWs streamlines hotel operations and optimizes labor distribution (Tan, 2015). Hotels with their websites, alongside other reservation systems, have a better chance to benefit from ORS compared to those without. Many hotels view their websites as a means to enhance visibility and reduce costs (Sanchez-Franco and Rondan-Cataluña, 2010). Additionally, Delizo and Esguerra (2013) suggest that OTAs enhance visibility and advertising for hotels, leading to wider access. Consequently, it is expected that over time, hotels without HOWs may consider adopting them to capitalize on their benefits.

The finding that the type of clients targeted recorded the highest factor loading while the range of services offered had the lowest loading aligns with Kouzmal et al.'s (2020) discovery that customers' decisions on online hotel booking significantly affect the adoption of OTAs by hotels. This suggests that a hotel's target clientele, whether international, local, corporate, or individual, influences its propensity to adopt ORS.

However, contrary to the findings from this study, Zhu (2004) and Bharadwaj (2000) found that firms' scope and size are crucial organizational factors for technology adoption. In Addis Ababa, Ethiopia, Demeke et al. (2016) found that political, socioeconomic, technological, and legal factors play a crucial role in determining whether ICT is adopted or rejected in hotels.

The agreement of respondents on managerial and economic factors being more likely to adopt OTAs for their hotels aligns with Ezzaouia et al.'s (2020) discovery that managers' perception of OTAs influences their adoption in hotels. Similarly, the agreement on technological factors influencing OTAs adoption supports Wang et al.'s (2016) finding that technology competence affects the implementation of online reservation systems in hotels. The emphasis on managerial issues as influential factors affecting mobile technology adoption among hotels, as found by Han et al. (2021), reinforces the critical role of managerial and economic factors highlighted in the conceptual framework.

The agreement among hotels regarding the adoption of OTAs is attributed to their strong marketing power and the widespread use of advantageous business models, facilitating revenue growth within shorter periods (Green and Lomanno, 2012). These findings imply that hotel managers should possess an understanding of the importance of managerial, economic, and technological factors of OTAs before adoption, as a lack of understanding or misunderstanding of these factors can hinder online practices (Papathanassis and Breitner, 2009).

The study further identified slow internet access, lack of qualified personnel, high commission rates, and lack of interaction between personnel and clients as the main barriers to the use of ORS. It is widely acknowledged that because online reservation is an internet-based booking system, internet readiness and stability can pose challenges (Buhalis and Costa, 2006), necessitating hotels to implement measures to address this issue.

These findings align with Zhou's (2004) identification of cost-related challenges for hotels maintaining their websites. Similarly, Ekiz et al. (2012) noted that OTA platforms enable potential guests to search for and compare hotels and prices before making online bookings, contributing to challenges associated with cost. Additionally, the results are consistent with Flavián et al. (2006) findings that the use of OTAs is associated with challenges such as cost, unstable internet connectivity, and reduced interaction between hoteliers and their clients in many cases.

Conclusion

The study has unveiled widespread adoption of ORS among highly-rated star hotels in the Accra Metropolis.

Managerial, economic, technological, and environmental factors influenced the adoption of Hotel-Owned Websites (HOWs), while organizational factors influenced the adoption of OTAs, with only technological factors influencing Global Distribution Systems (GDS). Star-rated hotels currently not using ORS but intending to do so later may benefit from government support, especially concerning the costs associated with internet access and other essential elements required for reliable ORS implementation. Hotels aspiring to adopt HOWs should carefully consider their managerial, economic, technological, and environmental circumstances, given the significant impact of these factors. Additionally, the study identified slow internet access, lack of qualified personnel, high commission rates, and insufficient interaction between personnel and clients as the primary barriers to ORS adoption. Future studies could explore ORS utilization among non-star-rated hotels to provide a comprehensive understanding of its implications across different segments of the hospitality industry.

THEORETICAL IMPLICATIONS

The study's findings align with the principles of the Innovation Diffusion Theory, highlighting the significance of innovation characteristics, communication pathways, and the social system in facilitating ORS adoption. To comprehend the broader implications of ORS adoption in the hotel industry, it's essential to consider adoption rates, adopter profiles, and factors influencing the diffusion process. Given the lack of prior research on the variables influencing ORS adoption in the Ghanaian context, this study fills a critical gap in the literature. Moreover, the data generated could serve as a valuable resource for researchers in other developing nations, enabling them to assess and validate potential disparities in ORS adoption across different contexts.

PRACTICAL IMPLICATIONS

The insights provided by this study will enlighten hospitality facility owners and practitioners about the factors influencing the adoption of ORS in the Accra Metropolitan zone.

MANAGERIAL IMPLICATIONS

As indicated by the study, several factors influence the adoption of Online Reservation Systems (ORS), including target clientele, management support, cost of technology equipment, customer willingness to utilize new technology, and consumer faith in the new technology. Therefore, in response to the current highly competitive environment and to maintain their market positions, hotel managers should adopt innovative strategies that consider all of these factors.

They should recognize the potential benefits of ORS, such as increased reservations, enhanced guest experiences, and improved operational efficiency.

Investing in robust ORS platforms and ensuring their continuous maintenance and updates can contribute to making star-rated hotels more profitable and competitive.

LIMITATIONS AND FUTURE RESEARCH

Indeed, this study has several limitations. Firstly, the focus on the Accra Metropolitan Zone restricted the data gathering, potentially limiting the generalizability of the findings. Secondly, relying solely on quantitative data gathering methods may overlook nuanced insights that qualitative approaches could provide. Future research should consider including other cities to broaden the sample size and employing a mixed methods approach to capture a more comprehensive understanding of ORS adoption in the hospitality industry.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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