Evaluating the Impact of ICT Usage on the Performance of Jamaican Hotels: A Conceptual Perspective

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For years, the hotel industry has been a dominant contributor in many economies by employing thousands of people and generating huge revenue annually and is currently the fastest growing economic sector in the world. This incredible success is largely attributed to the adoption of information and communication technology (ICT). Research has demonstrated that ICT adoption is a key influencing factor in enhancing hotel performance at both the strategic and operational levels. However, there is an appeal in the literature for more studies to evaluate the relationship between ICT adoption and hotel performance in developing countries. As a result, this conceptual paper is proposing a research model to evaluate the impact of ICT adoption on the performance of Jamaican hotels. It is hoped that future research will validate the proposed research model, which by extension can provide useful insights to hotel managers regarding the ICT services with the greatest influence on hotel performance.

Keywords: adoption, hotel, information and communication technology (ICT), Jamaica

Introduction

The hotel industry has been a dominant contributor in many economies by employing thousands of people and generating huge revenue annually and is currently the fastest growing economic sector in the world (Bethapudi, 2013; Paryani, Masoudi, & Cudney, 2010). This incredible success is largely attributed to the adoption of information and communication technology (ICT) (Richard, 2013), in which substantial capital is invested in designing products and services and improving hotel operation each year (Paryani et al., 2010). For example, the Sheraton Hotel initiated its guest satisfaction system to enhance its customers' lodging experience and boost its return rates (Jeong & Oh, 1998). Another cited example is the case of Carlson Hotels in Asia, where they were acknowledged for excellence in service standards and operations. This award was due mainly to their outstanding performance in areas such as revenue generated per available room, employee engagement, customer satisfaction, and quality assurance standards (Paryani et al., 2010).

ICT adoption is a critical success factor in enhancing hotel performance in terms of internal measures like productivity and revenue, as well as external measures such as customer satisfaction (Sirirak, Islam, & Khang, 2011). ICT is viewed as a strategic resource/asset (Aziz, Bakhtiar, Syaquif, Kamaruddin, & Ahmad, 2012) and a core competence in the hospitality/hotel industry, because it has the potential of providing business value and enhancing competitiveness (Bethapudi, 2013; Richard, 2013; Sirirak et al., 2011). Research has demonstrated that implementing ICT in the hotel industry has resulted in decreased costs, greater productivity, increased revenues, improved service quality, and improved guest satisfaction (Aziz et al., 2012).

American and European hotels have adopted ICT and successfully integrated systems like computer reservation system (CRS), customer relation management (CRM), enterprise resource planning (ERP), supply chain management (SCM), project management system (PMS), knowledge management system (KMS), and office automation system (OAS) and are able to realize the intended benefits (Li, 2012). However, hotels operated by Chinese entrepreneurs use ICT as a data processing tool to handle transactional documents processing which is a basic business activity along the value chain (Li, 2012). Compared with hotels in the developed world, hotels in China need to strategically integrate ICT applications with high order value chain functions, in an attempt to achieve the intended benefits (Li, 2012). Due to financial and human resource constraints in developing countries (Kimaro, 2006; Niazi, 2012) including Jamaica, it is believed that Jamaican hotels might also be operating at the basic business level along the value chain.

Jamaica, a small island in the English-speaking Caribbean, has a debt-to-GDP ratio of 147% (Wynter, 2014), which is one of the highest in the world (Williams & Jones, 2010). As a result, Jamaica and many developing countries are engaged in tourism as a means of earning foreign exchange in an effort to address their balance of payment woes (Hayle, 2011). In fact, Jamaica's Vision 2030 seeks to realize an inclusive, world-class Jamaican tourism industry that is a major contributor to socio-economic and cultural development, with a well-educated, highly motivated workforce at all levels within a safe, secure, and sustainable managed environment (Hayle, 2011). The major thrust by most stakeholders in the tourism industry in Jamaica is for guests to have a memorable experience while visiting the hotels on the island. Furthermore, many stakeholders and interest groups are hoping for the country to achieve sustainable tourism (Hayle, 2011).

To date, tourism is Jamaica's number one foreign exchange earner and it is growing at a rate of 4% every year. Tourism accounts for 25% of the jobs in Jamaica and 10% of the GDP (Jamaica Travel Secrets, 2013). In 2012, tourism contributed close to US\$4 billion dollars to the economy, with this revenue coming from more than three million visitors worldwide (Jamaica Travel Secrets, 2013). The major markets being targeted for visitor arrivals to Jamaica are USA, Canada, UK, Europe, Latin America, and Japan (Hayle, 2011). Products such as hotels, attractions, music, food, and culture are the main draw to the island (Jamaica Travel Secrets, 2013). The main marketing slogan is "Come to Jamaica for the Sand, Sun, and Beaches", which has a strong emphasis on leisure and recreation. The beaches and the warm sunshine are great attractions to Jamaican hotels, coupled with the view that Jamaican hotels are the second cheapest in the Caribbean behind Puerto Rico. Based on the cost and attractions, Jamaican hotels can be viewed as an excellent third place. Third places are institutions that provide social interaction outside of home and work (Crick, 2011). Third places are believed to be essential to life and well-being and make life more relaxed and less stressful (Oldenburg, 1999).

It is worth noting that the tourism product shows no sign of slowing down anytime soon (Jamaica Travel Secrets, 2013). Thus, the country needs to respond to the global trends in the industry with the deliberate intention of being globally attractive, which by extension can provide economic development. But from an administrative perspective, there has traditionally been a lack of coordinated effort between producers and regulators of tourism in developing countries (Hayle, 2011).

International tourist arrivals grew by 4.6% in 2011 to reach 983 million worldwide and is gaining momentum (Bethapudi, 2013). Some of the sectors involved in the tourism industry are adventure tourism, travel trade, food and beverage (F&B), accommodation, attractions, tourism services, transportation, and events and conferences (Hayle, 2011). Research as distilled by Bethapudi (2013) has shown that the purposes of tourist arrival globally are:

- (1) Leisure, recreation, and holiday: 51%;
- (2) Visiting friends and relatives (VFR), health, and religion: 27%;
- (3) Business and professional: 15%;
- (4) Not specified: 7%.

Perhaps Jamaica's marketing thrust needs to shift a little from the leisure and recreation visitors and target the business and professional visitors who might be able to have a great experience mixing business with pleasure at Jamaican hotels with fantastic beaches. This goal is achievable since hotels and hotel administrators can reach the targeted guests across the globe with a single click on a computer icon through the emergence of the internet, web technologies, and mobile computers (Bethapudi, 2013). Furthermore, ICT facilitates potential guests to access the hotel products, services, and information from anywhere at any time (Bethapudi, 2013). It is a widely held view by hotel administrators that ICT adoption is a key factor in promoting superior hotel performance (Siguaw, Enz, & Namasivayam, 2000).

However, there is an appeal in the literature for more studies to evaluate the relationship between ICT adoption and hotel performance, especially in developing countries (Mihalic & Buhalis, 2013; Sirirak et al., 2011). Hence, this study proposed a research model to answer the research question: "What is the impact of ICT adoption on the performance of Jamaican hotels?". It is hoped that future research will validate the proposed research model in an effort to provide useful insights to hotel managers/owners regarding the ICT services with the greatest influence on hotel performance in the Jamaican context.

Literature Review

ICT plays a major role in tourism, travel, hospitality, and the hotel industry. The integration of ICT in the hotel industry is very essential for the success of hotels (Bethapudi, 2013). In fact, some scholars believe that ICT can lead to economic development of nations (Aziz et al., 2012; Kamel, Rateb, & El-Tawil, 2009). The strategic goal by most hotel administrators is to integrate ICT with tourism in an effort to enable more accessibility, availability of a wide variety of products and services, visibility of information, and generation of customer satisfaction (Bethapudi, 2013). This effort involves the use of computer hardware, software, and telecommunication devices to store, manipulate, convert, protect, send, and receive data (N. Olifer & V. Olifer, 2006). The growth in the use of networked computers is one of the most significant trends to date (Ansah, Blankson, & Kontoh, 2012). Based on this development, hotels are using the technology to forecast guest demand for reservation, management of guest services, accounting for guests, data management, revenue management, reservation management, and yield management (Ansah et al., 2012). Yield management, for example, can provide a better control of room inventory and provide hotels with a wealth of data and information that could increase room occupancy and revenue (Knowles, 1998).

Intense competition and high customer expectation have led many hotels to explore innovative means to achieve competitive advantage (Sirirak et al., 2011). Some of the responses by hotels include investment in the latest technology in room reservation, room management, procurement and inventory systems, wireless internet, telecommunication, email, electronic transactions, hotel websites, and guest experiences (Aziz et al., 2012; Sirirak et al., 2011). Many hotels in developed countries are taking advantage of ICT to achieve superior performance and competitive advantage (Li, 2012). For example, networking the centralized reservation system (CRS) can enhance cost effectiveness, faster communication, effective exchange of information, and efficient management of data (Lucey, 2005). The hotel's CRS can be linked to airline CRSs to form a global reservation

system in an effort to allow travel agents and potential guests to make direct reservations. ICT has been transforming the hotel industry globally by developing a whole suite of software applications in an effort to gain superior performance in revenue, room occupancy rates, seat turnover rate, reduced operational cost, improved customer satisfaction, and excellent guest experience (Sirirak et al., 2011). However, in the midst of these successes, there are some threats (Bethapudi, 2013).

Chief among these are the realization by hotel administrators that a brand by itself is not enough (Knowles, 1998), coupled with the fact that many new destinations have emerged which are challenging the traditional ones (Bethapudi, 2013). Furthermore, customers are more sophisticated and are more demanding by requesting high-quality products and services and value for dollar spent (Bethapudi, 2013). It is also stated that the hotel industry is the most under-automated segment of the international travel industry (Bethapudi, 2013). In addition, there is a notion in the hospitality community that the hotel sector needs to speed up ICT implementation (Mihalic & Buhalis, 2013). With these declarations, hotels in Jamaica cannot solely rely on their excellent sun, sand, and beaches. They need to adopt the latest technology and implement current trends in terms of convenient services being offered to hotel guests.

The main services provided by hotels can be used to classify ICTs (Ham, Kim, & Jeong, 2005; Sigala, 2003). The four classifications of hotel services are as follows:

- (1) Room division ICTs (which will be called RD in this study);
- (2) F&B ICTs;
- (3) Back office ICTs (called BO);
- (4) In-room ICTs (called IR).

These areas cover the full complement of services provided by hotels to their guests both local and overseas. However, there are various factors which can influence the adoption and use of these ICTs in hotels.

It is posited that US hotels that belong to hotel chains are more innovative and as such are better able to adopt new technologies in comparison to lower tariff hotels that do not belong to any chain (Paraskevas & Buhalis, 2002). In addition, some hotel administrators are reluctant to adopt ICT due to technophobia (Siguaw et al., 2000). Van der Borg, Minghetti, and Riganti (1997) claimed that the implementation of ICT in small- and medium-sized Italian firms depends on whether they are located in urban or rural communities, family-owned hotels, and high attractiveness of the destination. However, most Jamaican hotels would be tempted not to respond to these developments and concerns on the basis of the high attractiveness of their destinations. But to survive and succeed in this industry, efforts must be made to improve both operational performance and guest satisfaction through the adoption and use of ICTs (Jones, 1999).

The diffusion of innovation (Rogers, 1995) is a theory that seeks to explain how, why, and at what rate a new technology (ICT) spread through an environment (a group, a community, a firm, or a country). The theory suggests that at the initial stages of diffusion of a new technology, some adopters (i.e., innovators) will choose to adopt a new technology independently of the decision of others within the social system. The first group of people to use the new technology is called innovators, followed by early adopters, next comes the early majority, then the late majority, and the last group to eventually adopt the technology is called laggards (Rogers, 1995).

The mobile phone penetration rate is high in Jamaica, with Jamaica, US, and UK being at 97%, 98%, and 131% respectively (The World Bank, 2012). The term “mobile phone penetration rate” describes the number of active mobile phone numbers (usually as a %) within a population (Ishii, 2004). This statistic of 97% speaks

well for Jamaica in terms of development to support technology-enabled businesses. Although Jamaica's percentage is high in comparison to Canada at 76% (a developed country) and many more advanced developing countries like China and India at 81% and 69% respectively (The World Bank, 2012), Jamaica's network readiness index is not very advanced. The country's ranking is 85th out of 144 ranked countries in the world, with an index of 3.74 (Bilbao-Osorio, Dutta, & Lanvin, 2013). The network readiness index seeks to ascertain the degree of a society's preparation and readiness to use and take advantage of an available ICT infrastructure (Dutta, Bilbao-Osorio, & Geiger, 2012). In fact, Jamaica's readiness index has decreased over 2012 figure, which was 74th out of 142 countries. This represents a decline from 74th in the global standing to 85th. Table 1 provides further details regarding the ranking of top-ranked developed countries and a few developing countries especially those in the English-speaking Caribbean (Bilbao-Osorio et al., 2013).

Since Jamaica's ICT readiness is somewhat low, it is suggested in this study that rather than taking (Rogers, 1995) diffusion of innovation approach from innovators to laggards, it is better that we use (Sigala, 2003) elements for measuring the level of ICT adoption in hotels. This involves three levels of ICT adoption, namely, availability, integration, and intensity of ICT services.

Table 1

The Networked Readiness Index 2013

Rank	Country	Score	2012 rank (out of 142)
1	Finland	5.98	3
2	Singapore	5.96	2
3	Sweden	5.91	1
4	The Netherlands	5.81	6
5	Norway	5.66	7
7	UK	5.64	10
9	US	5.57	8
12	Canada	5.44	9
21	Japan	5.24	18
39	Barbados	4.49	35
58	China	4.03	51
60	Brazil	3.97	65
68	India	3.88	69
72	Trinidad and Tobago	3.87	60
85	Jamaica	3.74	74
100	Guyana	3.45	90

In assessing ICT adoption in Jamaican hotels, this study proposed the use of the three levels of ICT adoption as proposed by Sigala (2003) as antecedents to established performance measures. Sirirak et al.'s (2011) research framework was adapted with minor modifications to develop the research model for this study. Figure 1 outlines Sirirak et al.'s (2011) research framework with its six constructs and their indicator variables.

The six constructs are:

- (1) Availability of ICT components;
- (2) Integration of ICT components;
- (3) Intensity of ICT component usage;
- (4) Outputs (an objective measure);
- (5) Inputs (an objective measure);
- (6) Customer satisfaction (a subjective measure).

The three antecedents of hotels' performance are ICT availability, integration, and intensity. These antecedents are shown in the research model as constructs along with their associated indicator variables which are the four classifications of hotel services. Hotel performance is a composite construct which includes output, input, and perceived customer satisfaction measures, with output and input being objective measures and perceived customer satisfaction being a subjective measure.

Figure 1. Research framework by Sirirak et al. (2011).

Figure 2. The proposed research model.

The proposed research model is shown in Figure 2 above in which ICT components are shown to influence hotel performance in terms of outputs, inputs, and customer satisfaction measures.

Methodology

This is intended to be a quantitative study using a self-administered survey approach. The survey items for the ICT availability, integration, and intensity constructs will be designed similar to the study of Sirirak et al. (2011). The details in Table 2 will be used to inform the survey items. Similarly, the details in Table 3 will be used to inform the survey items for the hotel performance construct, which again is similar to the study of Sirirak et al. (2011). Based on the information in both Tables 2 and 3, it is evident that the survey items will be adapted from various studies in IT adoption and ICT and its impact on hotel performance domains (Ansel & Dyer, 1999; Beldona & Cobanoglu, 2007; Choi & Chu, 2001; Gundersen, Heide, & Olsson, 1996; Heung, 2000; Sigala, 2003; Siguaw et al., 2000).

Table 2

The ICT Components in Each Hotel Operational Domain

Hotel operational domain	The ICT component
RD ICTs (Siguaw et al., 2000; Sigala, 2003; Ham et al., 2005; Chathoth, 2007; Beldona & Cobanoglu, 2007; and survey of 18 expert opinions)	Telephone and fax systems Website and email systems Global distribution system Guest account management system Check-in/check-out system Central reservation system Room status and housekeeping management Customer database system Statistic and report system
F&B ICTs (Ansel & Dyer, 1999; Siguaw et al., 2000; Sigala, 2003; Ham et al., 2005; and survey of 18 expert opinions)	Electronic point of sale system Stock and inventory system Conference and banqueting system Menu management system Table reservation system Order entry system Statistics and report system
General/back office ICTs (Sigala, 2003; Ham et al., 2005; Beldona & Cobanoglu, 2007; and survey of 18 expert opinions)	Human resource management system Purchasing system Financial and accounting systems Sales and catering system Generating report and update statistics system Management support system Teleconference system Decision support system Customer relationship management system Wireless internet connection area Security system Business center ATM in hotels
In-room ICTs (Sigala, 2003; Ham et al., 2005; Beldona & Cobanoglu, 2007; and survey of 18 expert opinions)	In-room telephone system Electronic locking system Energy management systems Automated wake-up system Voice mail system In-room internet access line/wireless In-room entertainment system In-room electronic safety boxes

Note. Source: Adapted from Sirirak et al. (2011).

Table 3

Perceived Customer Satisfaction Indicators

Customer satisfaction category	Indicator
Staff service quality (Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Politeness and friendliness of staff Helpfulness of staff Staff's understandings in job Efficiency of staff Multilingual skills of staff Neat appearance of staff Baggage handling service
Room quality (Gundersen et al., 1996; Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Room temperature control Cleanliness of room Quietness of room In-room audiovisual equipment Availability of room at check-in Availability of room during stay
General amenities (Gundersen et al., 1996; Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Efficiency of room service Variety of F&B facilities Quality of hotel F&B Reliability of wake-up call Access to information desk Availability of mini-bar Availability of personal care amenities Opening hours of F&B department
Business services (Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Availability of meeting rooms for business Availability of business-related facilities Availability of secretarial services provided by the hotel Availability of international direct dials
Value (Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Hotel F&B Accommodation Comfortable ambience Availability of frequent traveler's program
Security (Heung, 2000; Choi & Chu, 2001; and survey of 18 expert opinions)	Responsibility of security personnel Reliability of fire alarms Availability of safe boxes

Note. Source: Adapted from Sirirak et al. (2011).

The targeted survey respondents are intended to be hotel administrators and hotel guests, with the unit of analysis being hotels. Hotel administrators are believed to be the most knowledgeable personnel regarding the hotel operations and hotel guests are the candidates to provide feedback on in-room ICT usage and their perceptions on customer service. Hence, the questionnaire for hotel administrators is proposed to have three sections, namely, hotel demographic, ICT adoption, and hotel performance items, while the questionnaire for hotel guests is proposed to have three sections also, namely, guest demographic, intensity of in-room ICT usage, and perceived guest satisfaction items.

The market will be segmented by asking demographic questions relating to the size of the hotel and years in service. This approach will be taken as a control measure to compare hotels of similar sizes and maturity. A 5-point Likert type scale is proposed which will be anchored from 5 being highly satisfied and 1 being highly dissatisfied. Again, this approach is similar to the study of Sirirak et al. (2011). It is being proposed that data envelopment analysis (DEA) be used as the statistical tool to test the research model. Because it is a mathematical programming-based approach for measuring relative productive efficiency of firms or decision-making units (DMUs) that have multiple inputs and outputs (Cook, Tone, & Zhu, 2014).

Montego Bay is one of the most popular tourist resorts in Jamaica and so has a large pool of hotel guests to survey. In addition, the sample frame could be skewed towards 3-star hotels, because they are very popular in Jamaica. A pre-test would be conducted to assess face validity of the survey items at a few hotels in Montego Bay. In an effort to increase the robustness of the real survey study, various control measures will be taken. These include:

- (1) Collecting and analyzing data from 3-star hotels to control for hotel size;
- (2) Surveying hotels in Montego Bay to control for location.

Statistical Package for Social Sciences (SPSS) and DEA are suggested to be used for data analysis. SPSS could be used to conduct the descriptive analysis and DEA could be used to conduct a deeper analysis regarding the impact of the independent variables on hotel performance.

Conclusion

The study is intended to evaluate the influence of ICT adoption on Jamaican hotel performance in terms of operational and customer service measures. Based on the scope of the study, the findings must be limited to the Jamaican context. The implication for research in this study is for scholars to validate the proposed research model by evaluating the impact of ICT adoption on the performance of hotels in Jamaica. Other scholars could refine the research model to conduct further studies in other developing country contexts. Furthermore, this study provides the opportunity to falsify or justify the notion that Jamaican hotels are operating at basic business levels. This discovery would be a good incidental of the study.

The implication for practice could be realized through the findings of the study, with the main beneficiaries being hotel administrators. The study provides the opportunity to ascertain critical information on the hotel service which provides the greatest benefit on performance, as well as the ICT services with the greatest influence on performance. These findings can assist policy-makers at the national level and marketing personnel at the firm level in formulating optimal strategies to improve the Jamaican hotel industry.

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