

Research Paper

Factors Influencing Hotel Managers' Perceptions Regarding the Use of Mobile Apps to Gain a Competitive Advantage

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Abstract: The purpose of this quantitative study is to examine the opinions of hotel managers regarding the use of mobile applications in the hotel industry and to analyse the influence of these applications on a hotel's perceived competitive advantage. Factor analysis and multiple regression analysis were performed to analyse the data collected from 106 hotel managers in Turkey. The results of the study indicate that the factors *connection* and *assistance* had a significant impact on hotel managers' perceived competitive advantage. The findings of this study, one of the few that have examined managers' attitudes toward the use of mobile apps in the hotel industry, provide valuable information that will help to guide technology vendors and software companies that develop mobile apps for hotels.

Keywords: Mobile applications, hotel managers, competitive advantage, hotel industry

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Introduction

As a result of recent advancements in mobile technologies, the use of mobile devices has increased significantly (Kennedy-Eden & Gretzel, 2012; Coussement & Teague, 2013). According to Cisco, average smartphone usage grew 50% in 2013

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compared to 2012, and it is predicted that the number of mobile devices in use will reach 10 billion by 2017 (Cisco Visual Networking Index, 2014). In addition, the increased use of mobile devices has affected the number of mobile applications (app) downloads, which reached over 100 billion in 2013. It is predicted that this number will reach 180 billion in 2015 and 270 billion in 2017, and that 94.5% of these apps will be free (“Gartner says”, 2013).

Advancements in mobile technologies have influenced the travel and tourism industry as well (Wang, Park & Fesenmaier, 2012). For instance, according to a study conducted by Google (2012), 57% of people traveling for business use mobile devices, and people who plan their travel via mobile devices prefer to use them mostly for hotel reservations (The 2012 Traveler, 2012). Another study carried out by TripAdvisor found that almost half of European travelers (51%) connect to the Internet via their mobile devices during their vacations and that nearly one third of them (34%) claimed that they could not live without their mobile devices during their holidays (TripAdvisor, 2013).

To respond to these current trends, more hotels have started to reach their customers directly through mobile commerce (m-commerce). While traditional m-commerce refers to commercial activities performed on mobile devices via traditional mobile terminals (e.g., mobile payment and mobile advertising through mobile websites), current new technologies and applications such as location-based services (LBS), have emerged in the hotel industry (Zhong, 2013).

For example, hotels can utilise mobile apps to implement guest loyalty programmes, concierge assistance, or room service orders to offer an enhanced guest experience and to diversify their offerings. On the other hand, some mobile applications, such as mobile booking, may help hotels to expand their distribution channels and thereby explore new markets, which is an effective way of using existing products to increase sales. For example, studies have indicated that business travelers are 20% more likely to use their mobile devices to make hotel and restaurant reservations. In addition, they are significantly more likely to use their mobile devices, rather than their laptops, to access reviews and to look for activities or attractions. Therefore, providing a mobile app with mobile-booking capability may help hotels to attract more business travelers, even though this population may not be their main target market (Tripadvisor, 2014).

On the other hand, since mobile devices have smaller screens, mobile apps reduce information overload by filtering unnecessary information, a feature that helps hotels to provide more personalised services. In addition, with the recent increase in GPS-enabled mobile devices, hotels are able to provide personalised services to their customers based on their geographical locations (Wang & Wang, 2010). For example, some hotels such as the luxury hotel group, Ritz-Carlton, provide mobile

apps that offer personalised suggestions to guests, based not only on their locations but also on their duration of stay and past experiences (Nayer, 2012).

Information technology, in general, helps hotels to create a sustainable competitive advantage through product differentiation, effective marketing strategies, and improved cost control (Bilgihan, Okumus & Kwun, 2011). In this regard, we first need to examine how hotel managers perceive mobile apps and determine which mobile app factors affect their perceived competitive advantage.

Although numerous studies have examined the perception of mobile apps from the consumer perspective (Mahatanankoon, Wen & Lim, 2005; Kumar & Lim, 2008), little research has been conducted to date to explore the perception of mobile apps from the operators' point of view in the context of the hotel industry. In addition, most hospitality mobile application studies have mainly focused on the adoption and acceptance of the apps. Even though an investigation of the factors affecting the acceptance of an innovation is essential for the diffusion of innovation, prior studies have confirmed that the acceptance of an innovation may not necessarily guarantee a competitive advantage for the adopting firm (Bilgihan, Okumus & Kwun, 2011).

This study aims to examine the perception of managers towards mobile apps in the hotel industry. In addition, factors that influence the perceptions of hotel managers regarding the use of mobile applications for gaining a competitive advantage were also analysed. In the following sections, we discuss the relationship between information technology and competitive advantage, as well as the importance of mobile applications in the hotel industry. We then describe the research methodology, followed by a discussion of the results and the theoretical and practical implications of the findings.

Literature Review

As previously discussed, the rapid increase in mobile device usage has affected the number of downloadable apps for mobile devices. For example, on average, 25,000 to 30,000 apps are being added every month to Apple's App Store, with more than one million apps currently available, and more than 1.2 million apps on offer in Google Play (Apple, 2014). Statistics show that travel and tourism related apps are also on the rise as well. By 2012, there were more than 17,000 travel and tourism related apps on the market, and the numbers are growing (Sachs, 2012).

Mobile tourism applications, which cover a wide range of tools and functionality, include either predefined content or the use of mobile devices that are capable of accessing tourism-related content through mobile wireless coverage (e.g. 3G, 4G, LTE, and Wi-Fi) (Burgess, Sellitto & Karanasios, 2012; Kennedy-Eden & Gretzel, 2012; Coussement & Teague, 2013). Based on the information and communication

technology (ICT) model proposed by Angehrn (1997), Burgess et al. (2012) classified tourism and hotel mobile applications as follows (p. 706):

1. *The virtual information space* is where businesses can provide information about themselves and about the products they offer (e.g. product information, destination information, availability information, and rates information).
2. *The virtual communication space* is where businesses and their suppliers and customers can exchange ideas (e.g. relationship-building, information assessment, and consulting advice).
3. *The virtual distribution space* is where businesses can provide their goods for distribution to customers (e.g. guides, itineraries, and weather reports).
4. *The virtual transaction space* is where formal business transactions occur (e.g. reservations and payments).

Kennedy-Eden and Gretzel (2012) classified tourism and hospitality-related mobile apps into two groups: those designed for purposes of information and those designed for entertainment. Another study conducted by Zarpou, Drosopoulou & Vlachopoulou (2013) analysed 14 tourism and hospitality-related mobile apps and concluded that the majority of the mobile apps offered both navigation and information dissemination features.

Based on the discussion above, we can examine hotel mobile apps within the context of two categories: (1) customer-oriented apps and (2) operator-oriented apps. Customer-oriented apps enable consumers to connect, transact, and communicate with hotel representatives. Since these apps are designed specifically for customers, hotel managers and other employees do not have direct access to them. Through these apps, customers can use the GPS functionality to find hotels convenient to their current locations, access their rewards accounts, and make, review, modify, or cancel reservations. Furthermore, hotel guests can browse hotel photos, amenities, and maps. Operator-oriented apps, on the other hand, are specifically designed for hotel employees and managers. These apps assist hotel operators to improve their operational efficiency and the processes they use to manage the hotel. For example, by using front-office software (PMS) on a tablet, front desk managers can have access to all the information they need without physically being in the hotel. In this study, and based on Nyheim and Connolly's (2005) study, a hotel mobile app is defined as a downloadable mobile app that is capable of distributing hotel products and services (e.g. room sales) and/or automating a specific process or task in an operational environment.

Customer-oriented mobile application research in the context of hospitality and tourism has attracted a great deal of attention among academics, and several theoretical models have been proposed and tested to examine mobile application adoption in different settings. For example, Im and Hancer (2014) used the technology acceptance model (TAM) to investigate the direct and indirect relationships of

utilitarian motivation, hedonic motivation, and self-identity on travelers' attitudes toward the usage of travel mobile applications. The study's findings revealed that utilitarian motivation and self-identity had a significant impact on travelers' attitudes toward travel mobile applications and that hedonic motivation had a significant influence on utilitarian motivation. Another study conducted by Kwon, Bae & Blum (2012) examined customers' intentions to download mobile applications in the hospitality industry. Data collected from 235 college students demonstrated that the perceived ease of use and perceived usefulness significantly influence customers' intentions to download hospitality mobile applications. Okumus, Bilgihan & Ozturk (in press) investigated factors affecting customers' intentions to use smartphone diet applications when ordering food and beverages at restaurants. The authors defined diet apps as smartphone applications that provide nutrition information for menu items in restaurants. Data collected from 395 restaurant customers indicate that perceived enjoyment, perceived usefulness, social norms, and innovativeness all play significant roles in adopting smartphone diet applications.

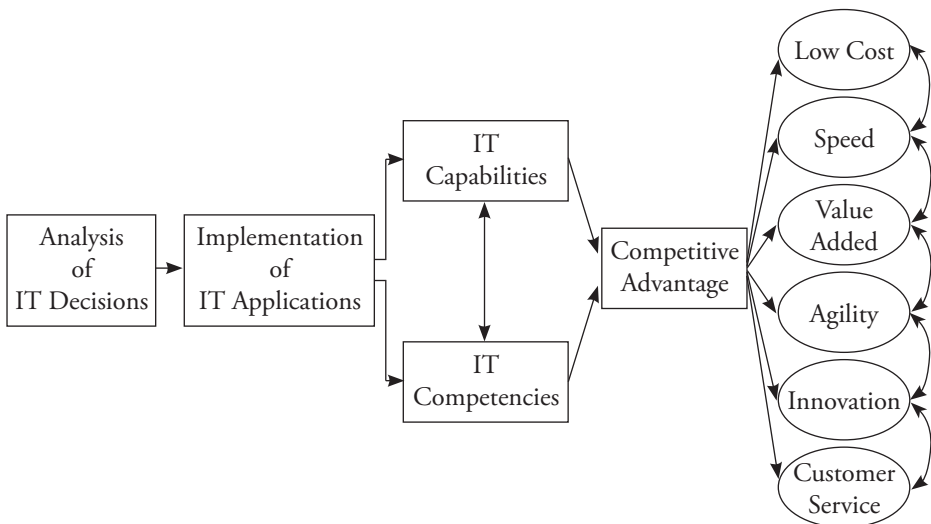
Compared to the number of customer-oriented mobile apps, there are fewer operator-oriented mobile apps in the hospitality and tourism industry. However, the number of mobile apps specifically developed for hotel managers is growing. For example, *HotelKey* is a cloud-based suite of native mobile apps designed to manage hotels. *HotelKey* includes a variety of mobile applications. The *FrontDesk* iPad app provides core hotel management functions such as making reservations, checking clients in and out, monitoring room servicing, and managing rates. The *Manager Mobile App* allows hotel managers to view the occupancy and financial statistics and to make rate changes on their smartphones while away from the front desk. The *Housekeeping Mobile App* enables housekeepers and housekeeping staff to update room cleaning or services with a real-time availability view, thereby enabling front desk clerks and hotel managers to better serve walk-in customers (Hotelkey, 2015).

ABreez, another recent app developed for minibar operations in hotels, is the hospitality industry's first cloud-based mobile application management tool designed for hotel food and beverage (F&B) managers. *ABreez's* features include automatic minibar posting through the PMS interface, room assignment lists per minibar attendant, real-time room status updates, inventory management, real-time visibility of all minibars/snack trays, detailed financial reports, automatic email reporting, and instant messaging. *ABreez* enables hotel management to increase productivity with more effective merchandising and cost control through a more efficient posting process (Mobile Simple, 2015).

The literature on information technology suggests that its applications could lead to creating a sustainable competitive advantage (Mata, Fuerst & Barney, 1995; Ugwu, Oyebisi, Illori & Adagunodo, 2000; Jessup & Valacich, 2002; Lewis, 2002; Xu, Zhao, Fang & Ren, 2013). Porter (1985) explained that competitive advantage

is formed by value, which a company creates for its customers and for which customers demand to pay. Superior value is formed by offering lower prices than other companies for similar goods and services or by presenting unique benefits (p. 3). Porter (1985) suggested two types of competitive advantage: (1) cost leadership and (2) differentiation.

Under cost leadership, the main goal is to gain a competitive advantage by attaining a cost-leadership position in the market (Bilgihan, Okumus & Kwun, 2011). With regard to differentiation, for a company to achieve a competitive advantage, it must offer an exceptional and unique product or service (Bilgihan, Okumus & Kwun, 2011). The authors further maintained that to understand how IT applications create a competitive advantage in hotels, some factors must first need to be determined. They summarised these factors as follows (Bilgihan, Okumus & Kwun, 2011) (Figure 1).



Source: Bilgihan, Okumus & Kwun, 2011, pp. 140

Figure 1. IT and competitive advantage

1. *Analysis of IT decisions in hotels:* Compatibility between business strategies and IT decisions, types of IT applications, proposed benefits of IT decisions, financial status of the company and existing financial resources, and decision-making style
2. *Implementation of IT applications:* Technology sophistication, management skills, integration of resources, and integration of IT projects with other systems

3. *Development of IT capabilities to create competitive advantage:* Internal competence, cost reduction, transformation of key business processes and practices into IT capabilities that significantly update and integrate the value chain, and elimination or reduction of unnecessary or non-value processes.
4. *Developing IT competencies to create a competitive advantage:* External focus and representation of an IT organisation's joint learning, including flexible Internet infrastructure, business to customer (B2C), business to business (B2B), customer self-service, IT value added to products, IT value added to services, and IT innovation.

Information technology contributes towards gaining a competitive advantage, especially through the mitigation of mistakes and the enhancement of productivity (Boddy & Buchanan, 1984). Buhalis (2003) stated that obtaining a competitive advantage related to time and cost and maintaining that advantage over the long term are the basic strategic functions supported by information technologies in the tourism industry. Similarly, a study conducted by Lee, Barker & Kandampully (2003) revealed that hotel managers consider information technologies to be an effective tool in gaining a competitive advantage.

Methodology

Research Instrument

The survey instrument was developed after an extensive review of the literature and informal interviews and discussions with experts (e.g. hotel IT managers and IT faculty members at several universities). The questionnaire consisted of two parts. The first part included 28 questions about mobile apps and competitive advantage. Respondents were asked to specify their levels of agreement with the questionnaire items by using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The second part of the questionnaire included four questions about respondents' demographic characteristics (i.e., gender, age, education, and job experience in the hotel industry). Fifty questionnaires were emailed to hotel managers as a pilot test, and corrections were made to ensure the clarity and readability of the survey.

Data Collection and Data Analysis

Data were collected from hotels in Turkey that are licensed for tourism operation and that use mobile apps. Hotel managers who are familiar with their hotels' mobile apps and who are interested in using mobile apps designed specifically for hotel managers comprised the target population of the study. Two screening questions were used to ensure that only hotel managers who had previous experience with their hotel's mobile apps and who are interested in using mobile apps designed specifically for

hotel managers participated in the survey. An online survey was used to collect the data. A list of eligible hotels and the email addresses of the hotel managers were obtained from the Ministry of Culture and Tourism of Turkey. An email invitation with a link to the questionnaire was sent out to the entire population to invite the hotels' general managers to participate in the survey. An email reminder (after one week) was sent out to the potential respondents to increase the response rate. In total, 2,343 emails were delivered, and 147 questionnaires were returned (a response rate of 6%). After the initial screening, 106 questionnaires were taken into consideration for further analyses.

The data collected through the study survey were analysed via the use of SPSS 16.0 (Statistical Package for Social Sciences). An exploratory factor analysis (EFA) was used to determine the construct validity and to group the questionnaire items into a few correlated factors. Multiple regression analysis was performed to determine whether there was a significant relationship between the factors derived from the factor analysis and the perceived competitive advantage.

Results

Demographical characteristics of the respondents are presented in Table 1. The majority of the participants were male (66%), and the remainder, female. Twenty-one percent of the participants were between the ages of 31 and 35, and a majority of the participants (55.7%) had bachelor's degrees. Twenty-three percent of the respondents had been working in the hotel industry for 25 years or more.

Table 1. Characteristics of respondents

Hotel manager characteristics	N	%
<i>Gender</i>		
Male	70	66
Female	36	24
Total	106	100
<i>Age</i>		
25 and below	5	4.7
26-30	16	15.1
31-35	22	20.8
36-40	22	20.8
41-45	22	20.8
46 and more	19	17.9
Total	106	100

Table 1 (cont)

<i>Education</i>		
Below high school	0	0.0
High school	10	9.3
Associate's degree	20	18.9
Bachelor's degree	59	55.7
Master's degree	17	16
Doctorate degree	0	0.0
Total	106	100
<i>Overall job experience in the hotel industry</i>		
1-5	7	6.6
6-10	23	21.7
11-15	16	15.1
16-20	22	20.8
21-25	14	13.2
25 and more	24	22.6
Total	106	100

Principal component analysis and VARIMAX rotation were selected for the factor analysis. Given the scree plot and theoretical relevance, only factors with Eigen values equal to or greater than 1 were taken into consideration. In addition, Bartlett's test of Sphericity value (6186.373) and the Kaiser-Meyer-Olkin overall measure of sampling adequacy (0.928) were significant in proving that factor analysis could be applied to the data. Only items with factor loadings of 0.5 and above were considered for the factor analysis.

Twenty-one (items that loaded less than .04 were dropped from the analysis) attributes from the factor analysis were grouped under four factors that explain 75.4% of the variance: Factor 1 (*usage*) explains 22.0% of the variance; Factor 2 (*connection*) explains 20.6% of the variance; Factor 3 (*information*) explains 16.7% of the variance; and finally, Factor 4 (*assistance*) explains 16.0% of the variance in the model. The results of the factor analysis are presented in Table 2.

Table 2. Summary of factor analysis results

Factors	Factor loadings	Eigen-value	Variance explained	Alpha
<i>Factor 1 (Usage)</i>		19.067	22.0	.945

Table 2 (con't)

1. Are effective integrally.	.700			
2. Are easy to use.	.646			
3. Enhance work performance.	.632			
4. Reduce paperwork.	.624			
5. Improve data control.	.621			
6. Accelerate the transactions.	.612			
7. Ensure to control things more easily.	.597			
8. Cause decision-making to be easier.	.582			
9. Increase the connection between departments.	.592			
<i>Factor 2 (Connection)</i>		1.642	20.6	.903
1. Ensure new customer acquisition.	.770			
2. Reinforce customer services.	.694			
3. Increase online bookings.	.575			
<i>Factor 3 (Information)</i>		1.583	16.7	.922
1. Information is presented understandably.	.780			
2. Provide reliable information.	.752			
3. Provide required information.	.673			
4. Process speed is sufficient.	.553			
5. Provide updated information.	.541			
6. Required information is reached in due time.	.500			
<i>Factor 4 (Assistance)</i>		1.220	16.0	.878
1. Expedite operational transactions.	.808			
2. Provide operational coordination.	.772			
3. Provide required operational reports.	.513			

Multiple regression analysis was conducted to determine whether there were significant relationships between the factors (*usage, connection, information, and assistance*) and the perceived competitive advantage. Table 3 represents the results of the regression analysis.

Table 3. Regression analysis for factors affecting competitive advantage

Variable	B	Standardized Beta	t	Sig
(Constant)	.722		3.043	.003
Usage	.172	.147	1.369	.174
Connection	1.003	.992	10.835	.001**
Information	.128	.113	1.370	.174
Assistance	.241	.240	2.911	.004**

Note: Multiple R=.874; Multiple R²=.764; Adjusted R² = .755; F = 80.951; Significance F = .000 ** sig. ≤ 0.01, * ≤ 0.05

The regression analysis results indicate that 76% of the variation in the dependent variable (*perceived competitive advantage*) was explained by the model. The results also indicate that only factors *connection* and *assistance* had a significant impact on *perceived competitive advantage*. In addition, when the standardized beta coefficients are considered, the results indicate that *connection* had the strongest impact on *perceived competitive advantage* (standardised β =.992) followed by assistance (standardised β =.240).

Discussion and Conclusion

Information communication technologies (ICTs) have been changing the tourism industry ever since the 1980s (Buhalis & Law, 2008). One of the most significant transformations resulting from the mobile devices and apps is a new and potentially powerful communication and distribution channel for travel service suppliers. In the hotel industry, mobile devices were first used to access a hotel's existing website as an alternative to using personal computers while on the move. As mobile devices have become increasingly accepted, the hotel industry, like other industries, has moved into new markets to develop new business models, such as mobile websites, mobile commerce, mobile payment systems, and, of course, mobile applications. All of these advances have turned mobile devices into an effective distribution channel and marketing tool for hotel operators.

On the other hand, hotel managers and employees have also started to use mobile apps to perform their jobs more effectively and without the need to adhere to time and space restrictions. However, as previously mentioned, prior hospitality and tourism studies have focused mainly on understanding end-users' (customers) perceptions and behavioral intentions regarding mobile applications. Even though customer-based mobile applications have become an integral part of hotel operations in expanding distribution and marketing channels, studies indicate that hotels are now also interested in employee/manager-based mobile applications. For example,

according to a study conducted by Lorden and Erdem (2015), 20.5% of the hotels in the United States reported that leveraging mobility for employee/manager-facing applications was their top technology priority in 2015. To the authors' best knowledge, the present study is the first to examine hotel managers' perceptions of the role of mobile applications in gaining a competitive advantage. In this context, the study provides a valuable theoretical contribution to the general body of knowledge in information technology, in general, and of mobile application research, in particular, by providing a comprehensive theoretical foundation that identifies which factors are important for obtaining a competitive advantage through operator-based mobile applications.

Compared to mobile websites, downloadable apps assist better in establishing a hotel's brand in the consumers' minds and securing their loyalty, which is a critical factor for gaining a competitive advantage. For example, when users download the mobile app of a hotel at which they are planning to stay (or already staying), they tend to also use the app for other services provided by the hotel. In addition, users will see the app on their mobile devices regularly, and when they need to book a hotel room again, they may prefer to use the app that has already been downloaded and contains the user's information (e.g., name, address, and credit card information) instead of visiting the mobile website of a new hotel and re-entering all the required information.

In general, this study has proved that hotel managers perceive mobile apps as an important source of support in gaining a competitive advantage. The study results indicate that one of the factors that had a positive impact on hotel managers' perceived competitive advantage was *connection*. Hotel managers believe that mobile apps are effective tools which can be used to stay connected with their current customers and acquire new ones. In addition, they view mobile apps as having the ability to reinforce the activities of customer service and to accelerate transactions through mobile booking, which will help them gain a competitive advantage in the market that they are operating in. Therefore, it is suggested that mobile apps should be designed in a way that would expedite connections between hotel managers and guests. In this regard, mobile apps developed for the guests and for the operators (managers) should have the capability to interact with each other. In addition, mobile apps should provide as much guest-related information as possible, which will enable hotel managers to easily access required information. The guest-related information should be up-to-date, so that hotel managers can connect with their guests more accurately and more effectively while they are away from their desks. In addition, mobile apps should be able to analyse the characteristics of the guests, as this is a critical function which hotel management can use to meet their guests' expectations and provide more personalized services in a timely manner.

The results of the study also indicate that hotel managers' perceived competitive

advantage is influenced by *assistance*. Hotel managers believed that hotel mobile apps provide operational coordination and expedite operational transactions. For example, through mobile apps, guest requests may be recorded and organised in a way that may speed up the process, since there is no need for minimal phone calls to occur between the hotel staff and the guests (i.e., there is no need to introduce yourself and greet the guest on every call). In addition, since guest requests are in written format, misunderstandings will also be minimised. Furthermore, with the advancements in global positioning systems (GPSs) and location-based services (LBS), hotels are now able to offer personalised services according to their guests' preferences. For example, when a customer wants to use a mobile device to book a hotel room nearby, the system, through GPS technology, will provide information only for those hotels close to the customer's location. All of the capabilities offered by mobile hotel apps help hotel managers and staff to perform their jobs more efficiently and effectively. To increase the mobile applications' *perceived assistance*, hospitality technology vendors, in general, and hotel mobile application developers, in particular, should keep in mind that mobile apps should be easily integrated into existing technologies within the hotel. Integration with the hotel management system allows managers to use the management system anywhere inside or outside of the hotel. With a mobile app that is integrated with the hotel's property management system (PMS), for instance, a manager is able to view operational reports, such as occupancy rate, average daily rate (ADR), number of rooms available for sale, number of rooms sold, and revenue per available room (REVPAR) through his or her mobile device without actually being at the hotel or looking up the information on his or her personal computer. In addition, mobile apps should support mobile printing, whereby hotel managers can easily print reports directly from their smartphones or tablets.

This mobility allows hotel managers to access required information easily, thereby helping them to spend less time on administrative tasks and more time on customer relations. In addition, front-office employees can use mobile devices to help guests waiting in the lobby area for front desk services. For example, if there is a long line of guests waiting for check-in, front desk staff can move away from the counter-desk and help the guests who are waiting in line by using their PMS-integrated mobile devices. In this way, hotel managements are able to reduce the staff needed in the front-office department or move them to other positions.

Moreover, the findings of the study may guide technology vendors and software companies that develop mobile apps for hotels. As the results of the study indicate, *connection* and *assistance* were the most important characteristics of hotel mobile apps used by hotel managers in gaining a competitive advantage. Therefore, it is important that technology vendors create mobile apps that help hotel managers to reach their existing and potential customers easily and to perform their operational tasks effectively.

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References

- Angehrn, A. (1997). Designing mature internet business strategies: the ICDDT model. *European Management*, 15(4), 361-369.
- Apple Press Info. (2014, May 10). App Store sales top \$10 billion in 2013. Retrieved from <http://www.apple.com/uk/pr/library/2014/01/07App-Store-Sales-Top-10-Billion-in-2013.html>.
- Bilgihan, A., Okumus, F., & Kwun, D. J. W. (2011). Information technology applications and competitive advantage in hotel companies. *Journal of Hospitality and Tourism Technology*, 2(2), 139-153.
- Boddy, D., & Buchanan, D. A. (1984). Information technology and productivity: myths and realities. *Omega*, 12(3), 233-240.
- Buhalis, D. (2003). *E-Tourism: Information technology for strategic tourism management*. New Jersey: Prentice Hall.
- Buhalis, D. & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the internet - The state of e-tourism research. *Tourism Management*, 29(4), 609-623.
- Burgess, S., Sellitto, C., & Karanasios, S. (2012). A model of ICDDT Internet flows on mobile devices for the travel and tourism consumer. *Tourism Analysis*, 17(6), 705-719.
- Cisco. (2015, June 10). Cisco Visual Networking Index: Global mobile data traffic forecast update 2014–2019. Retrieved from http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html
- Coussement, M. A., & Teague, T. J. (2013). The new customer-facing technology: mobile and the constantly-connected consumer. *Journal of Hospitality and Tourism Technology*, 4(2), 177-187.
- Gartner. (2014, May 1). Gartner says mobile app stores will see annual downloads reach 102 billion in 2013. Retrieved from <http://www.gartner.com/newsroom/id/2592315>.
- Hotelkey. (2015, Oct 15). Mobile hotel management. Retrieved from <http://hotelkeyapp.com/>
- Im, J. Y. & Hancer, M. (2014). Shaping travelers' attitude toward travel mobile applications. *Journal of Hospitality and Tourism Technology*, 5(2), 177 - 193
- Jessup, L. M. & Valacich, J. S. (2002). *Information systems today*. New Jersey : Prentice Hall.
- Kennedy-Eden, H., & Gretzel, U. (2012). A taxonomy of mobile applications in tourism. *E-Review of Tourism Research*, 10(2), 47-50.
- Kumar, A., & Lim, J. (2008). Age differences in mobile service perceptions: comparison of Generation Y and baby boomers. *Journal of Services Marketing*, 22(7), 568-577.

- Kwon, J. M., Bae J., & Blum, S. C. (2013). Mobile applications in the hospitality industry. *Journal of Hospitality and Tourism Technology*, 4(1), 81 – 92.
- Lee, S. C., Barker, S., & Kandampully, J. (2003). Technology, service quality, and customer loyalty in hotels: Australian managerial perspectives. *Managing Service Quality*, 13(5), 423-432.
- Lewis, M. A. (2002). Selecting and implementing service technology: control, uncertainty and competitive advantage, *Service Industries Journal*, 22(2), 17-42.
- Lorden, A.A. & Erdem, M. (2015). Lodging technology study: Hotel tech to pass “go” in 2015. Retrieved from <http://hospitalitytechnology.edgl.com/reports/2015-Lodging-Technology-Study97079>.
- Mahatanankoon, P., Wen, H.J., & Lim, B. (2005). Consumer-based m-commerce: exploring consumer perception of mobile applications. *Computer Standards & Interfaces*, 27(4), 347-357.
- Mata, F. J., Fuerst, W. L., & Barney, J. B. (1995). Information technology and sustained competitive advantage: a resource-based analysis. *MIS Quarterly*, 19(4), 487-505.
- Mobile Simple. (2015). ABreez is mobile. Retrieved from <https://www.mobile-simple.com/MyMinibarApp>.
- Nayer, M. (2012). Ritz-Carlton debuts mobile app packed with personalized info, hotel insights. Retrieved from http://www.boston.com/travel/explorene/blogs/packup/2012/05/ritz-carlton_launches_mobile_a.html.
- Nyheim P. D., & Connolly, D. J. (2005). *Technology strategies for the hospitality industry*. Columbus, Ohio: Prentice Hall.
- Okumus, B., Bilgihan, A., & Ozturk, A. B. (2016). Factors affecting the acceptance of smartphone diet applications. *Journal of Hospitality Marketing and Management*, 25(6), 726-747.
- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York : The Free Press.
- Sachs, A. (2012). Travel apps for smartphones and tablets explode, but how to find good ones. Retrieved from http://www.washingtonpost.com/lifestyle/travel/travel-apps-for-smartphones-and-tablets-explode-but-how-to-find-goodones/2012/05/17/gIQRnsyYU_story.html.
- In Think with Google. (2012). The 2012 Traveler. Retrieved from <https://www.thinkwithgoogle.com/research-studies/the-2012-traveler.html>
- TripAdvisor. (2013). Tripadvisor Industry Index global survey reveals hotel industry's top trends. (2013). Retrieved from http://cdn.tripadvisor.com/pdfs/email/IndustryIndex_English.pdf.
- Ugwu, L.O., Oyebisi, T.O., Ilori, M.O., & Adagunodo, E.R. (2000). Organizational impact of information technology on the banking and insurance sector in Nigeria. *Technovation*, 20, 711-721.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371-387.

- Wang, H. Y., & Wang, S. H. (2010). Predicting mobile hotel reservation adoption: Insight from a perceived value standpoint. *International Journal of Hospitality Management*, 29(4), 598-608.
- TripAdvisor. (2014, May 13). When briefcases meet suitcases: Business travelers in 2014. Retrieved from <https://www.tripadvisor.com/TripAdvisorInsights/n2421/when-briefcases-meet-suitcases-business-travelers-2014#sthash.t67tLinl.dpuf>
- Xu, Y. Y., Zhao, Y. W., Fang, Z., & Ren, Y. D. (2013). Mobile advertising: the new promising marketing channel. *Advanced Materials Research*, 774, 1987-1990.
- Zarpou, T., Drosopoulou, C., & Vlachopoulou, M. (2013, September). *Mapping the tourism mobile applications: what, how and where*. Paper presented at the 6th Balkan Conference in Informatics.
- Zhong, W. (2013, April). *The analysis of mobile internet impacts on electronic commerce system construction*. Paper presented at the 2nd International Conference on Systems Engineering and Modeling (ICSEM-13).