ASSESSING MOBILE PAYMENT FOR HOTEL RESERVATIONS IN CHINA

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CERTIFICATE OF ORIGINALITY

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Abstract

The rapid development of mobile technology and a growing number of smartphone users have greatly changed the payment behavior of consumers for hotel reservations. Although website functionality and website usability have gained extensive attention from previous literature, limited studies have investigated functionality and usability toward mobile payment for hotel reservations through online travel agencies (OTAs). To fill this gap, the present study develops a research framework based on theory of planned behavior (TPB) advocated by Ajzen (1991) and the conceptual model of website evaluation developed by Bai, Law, and Wen (2008). Attitude, subjective norms, and perceived behavioral control are the three most important elements involved in TPB whereas functionality and usability are the two main components of the conceptual model of website evaluation developed by Bai et al. (2008).

The first research question of the present study is how effective is smartphone in delivering hotel-booking information? The corresponding objective is to assess the quality of hotel-booking information delivered via smartphone. The second research question is what are the impacts of functionality and usability toward mobile payment on hotel repurchase intention? The detailed objectives are within the context of mobile payment for hotel reservations: i) to test the mediating effects of attitude, subjective norms, and perceived behavioral control on the relationship between mobile functionality and customer satisfaction; ii) to test the mediating effects of attitude, subjective norms, and perceived behavioral control on the relationship between mobile usability and customer satisfaction; and iii) to test the mediating effects of customer satisfaction on the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention. By mainly adopting a quantitative research method, the findings show that

overall, smartphone is effective in delivering hotel-booking information. In addition, the findings reveal that hotel-booking information can be categorized into four factors: hotel information, communication and interaction, design and layout, and consumer requests based on principal component analysis. Moreover, through conducting principal component analysis, the proposed constructs and the related attributes of mobile payment for hotel reservations are identified. Exploratory factor analysis further confirms the proposed constructs. Finally, the overall structure of the proposed research framework is examined through structural equation modelling. In total, 15 hypotheses are advocated, with nine hypotheses are supported. Specially, results show that within the context of mobile payment for hotel reservations, the mediating effects of attitude, subjective norms, and perceived behavioral control exist between mobile usability and customer satisfaction, but do not exist between mobile functionality and customer satisfaction. In addition, the mediating roles of customer satisfaction exist between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention.

In conclusion, theoretically, the present study proposed a research framework and proved the model's applicability within the context of mobile payment for hotel reservations. Practically, the findings can help hotels facilitate hotel reservations, satisfy the needs of customers, and enhance the repurchase intention of consumers. That is, hotel managers can communicate with OTAs to improve functionality of mobile payment through providing detailed mobile payment information for hotel reservations. Furthermore, hotel managers can communicate with OTAs to improve usability of mobile payment for hotel reservations through operation simplification, safety management, and experience management.

Keywords: mobile payment, assessment, hotel reservation, online travel agency, China

Publications arising from the thesis

1. Referred journal articles

1. Sun, S., Fong, D., Law, R., & He, S. (2017). An updated comprehensive review of website evaluation studies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 29*(1), 355-373.
2. Law, R., Sun, S., Fong, D.K.C., Fong, H.N.L., & Fu, H. (2016). A systematic review of China's outbound tourism research. *International Journal of Contemporary Hospitality Management, 28*(12), 2654-2674.
3. Sun, S., Law, R., & Tse, T. (2016). Exploring price fluctuations across different online travel agencies: a case study of room reservations in an upscale hotel in Hong Kong. *Journal of Vacation Marketing*, *22*(2), 167-178.

2. Conference presentations

1. Sun, S., Law, R., & Schuckert, M. (2017). How does mobile technology achieve value co-creation in Tourism? *2017 International Symposium on Business and Management.* April 4-6, Kyoto, Japan, pp. 555-558.

3. Conference publications

1. Sun, S., Law, R., Schuckert, M., & Buhalis, D. (2018). Chinese travelers' mobile payments: Market disruption and risk. *Information and Communication Technologies in Tourism 2018.* In Stangl, B. & Pesonen, J. (Eds.). ENTER 2018 Proceedings. Berlin Heidelberg: Springer-Verlag, pp. 336-348.

4. Book reviews

1. Sun, S., & Law, R. (2017). User acceptance of mobile notifications. *Information Technology & Tourism, 17*(3)*, 371-373*.

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Chapter 1. Introduction

1.1 Chapter introduction

Chapter 1 provides the background information of the present study, including the introduction of information and communications technology (ICT), smartphone users, smartphone/mobile app hotel reservations, mobile payment, and theory of planned behavior. In addition, problem statement, main research questions, objectives of the present study, and the significance of the present study are discussed.

1.2 Background

The use of the Internet to communicate with customers has been growing rapidly worldwide in hospitality (Bhatiasevi & Yoopetch, 2015; DeFranco & Morosan, 2017). The wide application of ICT has raised the level of sophistication of information dissemination, product distribution, and transaction in the hospitality practices (Golmohammadi, Jahandideh, & O'gorman, 2012). At the same time, the number of smartphone users has been increasing in the recent five years since 2013 globally. In 2014, the number of smartphone users exceeded traditional personal computer (PC) users the first time in China (Jin, 2014). Additionally, by the end of August 2014, mobile subscribers in China had already reached 1.27 billion, of which 480 million were 3G users whereas 30 million were 4G users (China Internet Watch, 2014). By the end of 2016, smartphone users in China had reached 563.1 million (Statista, 2017b). According to Perez (2015), the number of smartphone users in China had exceeded that of the sum of the US, Brazil, and Indonesia. In China, the market of smartphone users continues to grow, and it is forecasted that the market penetration of smartphone users would reach 88.9% by 2019. Indeed, in China, people use smartphone users in many places, such as in stores (75%), outdoors (74%), and during travel (68%) (Forrester Research, 2013). As with the findings of Lamsfus, Wang,

Alzua-Sorzabal, and Xiang (2015) that the wide adoption of smartphones has changed the behavior of tourists, such as the way they obtain information, the way they make purchase decisions, and the way they share experience.

Thus, along with the increasing ownership of multiple mobile devices (e.g. smartphone, tablet), the assumption of online travel planning such as hotel reservations can only be performed on a PC or a notebook may not be applicable to tourists (Schegg, Stangl, Fux, & Inversini, 2013). For example, Yang, Chu, and Yang (2006) indicated that mobile travel booking denotes a consumer uses portable mobile devices such as a mobile phone to book hotels, air tickets, and other tourism products/service through wireless networks such as wireless fidelity (WiFi). Murphy, Chen, and Cossutta (2016) confirmed that at present, hotel managers do not assume that most of their customers are notebook users because customers tend to use multiple devices for hotel reservations such as smartphones. Recently, Fong, Lam, and Law (2017) also found that mobile app is a new channel for OTAs to increase their sales. The above evidence reveals that hotel reservation is an important component of mobile travel planning. Along with the wide adoption of smartphones, mobile apps also gain the popularity among users because of their capability in facilitating functions such as distributing information and managing customer relationship (Leposa, 2012). According to Gonzalo (2016), from 2011–2015, travel-related mobile booking grew by 1700%, and it contributed to online revenue from 1% to 18% globally. China Mobile Internet Report (2014) revealed that an increasing number of Chinese smartphone users downloaded mobile applications (apps), and 74.6% of them downloaded the mobile apps in the past six months. eLong, Home Inns, and Booking were the top three downloaded hotel booking apps in March 2017, with over one million monthly actively users in China (China Internet Watch, 2017c). Meanwhile, Ha, Canedoli, Baur, and Bick (2012) found that most hotel

brands have developed their own hotel apps to on the one hand simplify the process of hotel booking and on the other hand enhance the interactions with consumers. Park and Huang (2017) indicated that within Chinese context, smartphones are revolutionizing the decision-making process of consumers for mobile hotel reservations. On the whole, the apps developed for hotel reservations facilitate the direct hotel distribution, and increase the fulfillment of ancillary services. At present, mobile hotel booking is regarded as key booking platforms in China, and China is leading the mobile hotel booking market through OTAs. For example, 40% of hotel bookings of Ctrip, the leading online travel agency in China, were contributed by its mobile platforms (China Internet Watch, 2016). In addition, mobile travel apps had reached additional 90 million each month from July to September in 2014 (Tnooz, 2014). Furthermore, according to Phocuswright (2017), 60% of travel online booking were made on mobile devices in China by the end of 2017. The above evidence proves the vital role of mobile devices/mobile apps for hotel reservations in China.

Electronic commerce (e-commerce) is considered as an effective platform that enables trading among suppliers (e.g. travel agents), customers, and the marketers of products. In other words, direct bookings using electronic payment for hotel reservations can be achieved (Bhatiasevi & Yoopetch, 2015). As Bhatiasevi and Yoopetch (2015) unearthed that the change of the adoption of electronic payment (e-payment) has resulted in the increase of online users to use e-commerce related transactions. Since 2013, mobile commerce (m-commerce) has been gradually occupying the market, particularly the market of China because smartphones and the mobile apps widely support the e-payment system, and mobile payment is a revolution of e-payment.

Mobile payment in the present study refers to the third-party mobile payment for hotel reservations via smartphones through mobile network operators or wireless technologies under financial regulations in China. According to China Mobile Internet Report (2014), the increasing rate of mobile payment had exceeded 100% from 2013 (23.9%) to 2014 (58.3%). The statistics of China Central Bank indicated that mobile payment (i.e. third-party mobile payment) had a rapid increase in 2015 in China. The volume of mobile payment transaction reached RMB 480 million, with an increase of 191.8% year-on-year in the second quarter of 2015, and the total value of mobile payment reached RMB 4.19 trillion with an increase of 445.1% year-on-year in the same period. However, traditional bill business dropped much during the same period. That is, the volume of total traditional bill business transaction was RMB 104 million with a value of RMB 9.31 trillion, which decreased by 11.7% compared to that in 2014 (China Internet Watch, 2015). In addition, in the first quarter of 2017, China's third-party mobile payment transactions had reached USD 820 billion, which is equal to roughly RMB 5,495 billion (China Internet Watch, 2017b). Figure 1 shows the prediction of mobile payment transaction volume in China. It is expected that by 2018, the volume would reach RMB 18,255.98 billion. DeLuna (2014) reported that according to a survey conducted by air transport technology firm SITA and Air Transport World, for 6,277 leisure and business travelers who had their travel in the past six months, nearly half of the respondents would definitely adopt mobile payment while travelling. Globally, consumers are embracing mobile payment for hotel reservations, and China is in the front rank. As payment week reports illustrated that for tourists in China who responded to a survey of Hotels.com, 60 percent of them said that they regard the provision of mobile payment as a very important factor when they make hotel reservations (Hotel Online, 2015).

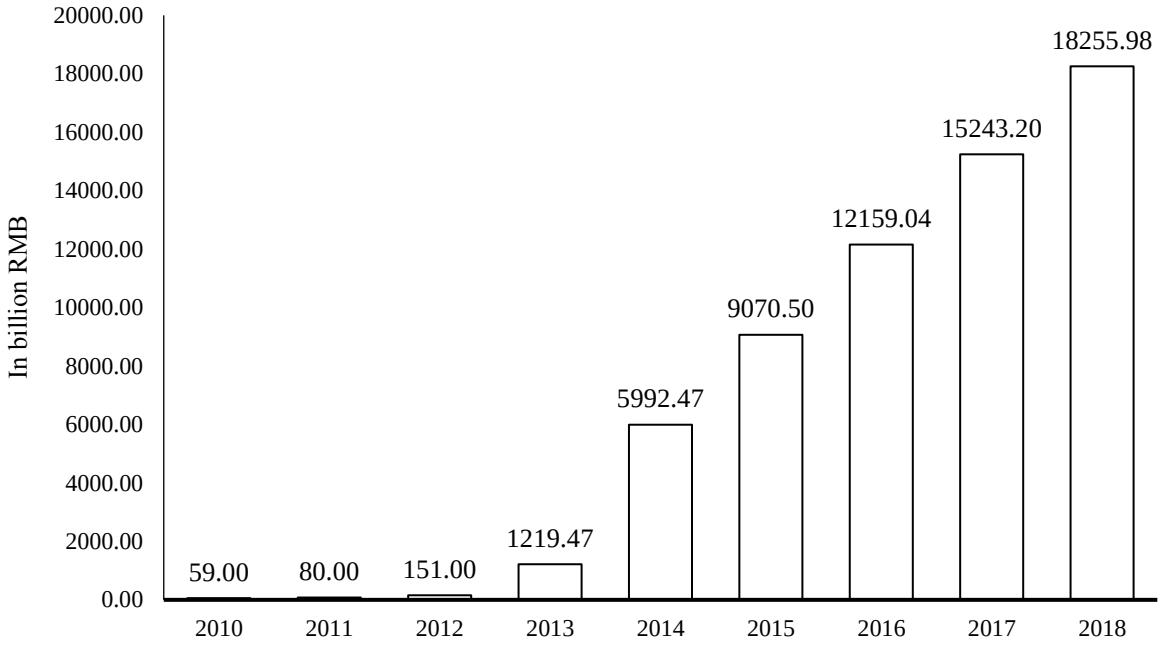


Figure 1. Third-party mobile payment transaction volume prediction

Source: Statista (2016)

The survey results show that smartphone hotel reservation using mobile payment has the great potential to dominate the market in China at present. Nonetheless, the performance of smartphone hotel reservation is not clear. Previous studies have evaluated the effectiveness of hotel website performance using different evaluation models, with functionality and usability as main dimensions (Bai et al., 2008; Kim & Kim, 2008; Law, Qi, & Leung, 2008). Functionality refers to content whereas usability refers to design. Within mobile context, mobile functionality denotes content delivery via smartphones whereas mobile usability signifies the design displayed on smartphones. The performance of smartphones in the present study reflects mobile functionality and usability in delivering hotel information and the whole process of completing a hotel reservation. Results of previous studies showed that functionality and usability, two fundamental and common indicators of hotel website performance, positively affect customer satisfaction (Bai et al., 2008; Li, Peng, Jiang, & Law, 2017). Several studies also proved the positive relationship

between customer satisfaction and the revisit intention of consumers (Ladhari & Michaud, 2015; Liu, Arnett, & Litecky, 2000). Repurchase intention indicates the intention of customers to repurchase the next time. In other words, the higher the repurchase intention, the more likely that consumers will turn their intention to the actual behavior (Hsu & Huang, 2012). The present study focused on the repeaters because on the one hand, repeaters are more loyal than first-time users; and on the other hand, it costs less for organizations to attract repeaters. In addition, repeat visitors provide considerable revenue to the organizations. Most of the previous studies discussed repeaters in tourism context. For example, Liu, Lin, and Wang (2012) indicated that in terms of destination loyalty, repeat visitors are significantly more loyal than first-time visitors. Moreover, Chi (2010) unearthed that only one third of the visitors are first-time visitors and the remaining two thirds were repeat visitors, indicating that repeat visitors occupy a very big market. Nonetheless, limited studies explored repeaters within hospitality context. Recently, Liang, Choi, and Joppe (2017) unearthed the factors that affect the repurchase intention of consumers in rebooking Airbnb, and the findings indicated that the perceived value positively affects the repurchase intention of consumers for Airbnb products. The above evidence implies that repeat customers are an important and big market that is worthwhile for investigation.

The particular significance of studying mobile payment for the hospitality sector is its perishable nature. Hence, hotels are always trying to seize each opportunity to sell hotel rooms. Meanwhile, mobile payment has been widely adopted in people's daily life, and they have been accustomed to the use of mobile payment. Thus, mobile payment is an important aspect that can be considered by hotels to increase the sales. In other words, whether payment is easy and convenient to operate determines the intention of consumers to book hotel rooms. As a result, considering the wide adoption and the increasing transaction volume of mobile payment in China,

the present study investigates the impacts of mobile functionality and mobile usability on repurchase intention within the context of mobile payment for hotel reservations.

The present study is based on theory of planned behavior because TPB is a fundamental theory, which was first advocated in psychology to predict human behavior, and to explain the underlying reasons that lead to certain consumer behavior (Ajzen, 1991). Consumer behavior in the present study refers to mobile payment for hotel reservations. Previous website evaluation related studies mainly adopted website evaluation model (Bai et al., 2008; Sun, Cárdenas, & Harrill, 2016). Nevertheless, website evaluation model is inadequate in providing detailed aspects of functionality and usability that lead to repurchase intention. Thus, the present study integrates the conceptual model of website evaluation into theory of planned behavior to comprehensively understand mobile payment for hotel reservations because it can predict behavior intentions accurately from three perspectives: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). Attitude toward the behavior is relatively simple, it refers to either favorable or unfavorable attitude toward a certain behavior (Ajzen, 1985). In the present study, attitude refers to favorable or unfavorable attitude toward mobile payment for hotel reservations. Fishbein and Ajzen (1975, p. 302) defined subjective norms as "the degree to which an individual perceives that most people who are important to him think he should, or should not use the system." In the present study, subjective norms refer to what most people in their social networks think they should use mobile payment for hotel reservations. With regard to perceived behavioral control, it refers to the ability of a consumer to control the behavior. For example, antecedents such as the concerns of privacy influence the information disclosure of consumers (Hui, Teo, & Lee, 2007), and reputation or trust (Metzger, 2006). In other words, given by a certain degree of actual control, when opportunities arise, people are

expected to carry out their actions. Perceived behavioral control in the present study reveals the ability of consumers to use mobile payment for hotel reservations. In summary, the present study integrates the conceptual model of website evaluation into theory of planned behavior to examine the repurchase intention of hotels.

1.3 Problem statement

Although previous studies have evaluated the performance of travel-related desktop version websites (Bastida & Huan, 2014; Morrison, Taylor, & Douglas, 2004; Sun et al., 2016), mobile version websites and desktop version websites are different in terms of content and design as discussed by the studies of Google Developers (2015) and Meunler (2012) as shown in Table 1.

Table 1. Differences between desktop version websites and mobile websites

Differences	**Desktop version websites**	**Mobile version websites (wap, app)**
Content		
Display	Detailed	Targeted
Dynamic serving	No	Yes
Filters	More	Less
Instant preview	Depends	Yes
Scale	Global results	Local results
Recognition	Manual results	Autocomplete results
Design		
Login mode	Website address input	QR code scan/ Direct login/ Always logged in
Responsive website design	Bigger screen	Smaller screen
Screen resolution	High	Low
Separate URLs	No	Yes

For content, in the aspect of information display, desktop version websites provide detailed information whereas mobile version websites, also known as mobile websites displayed by mobile devices show relative targeted information (Google Developers, 2015). Moreover, desktop version websites do not have dynamic serving whereas mobile websites have. In addition, desktop version websites have more filters while mobile websites have less. Furthermore, the scale of the results of desktop version websites are relative global whereas that of mobile websites are relative local. Unlike desktop version websites, mobile websites provide instant preview and autocomplete results.

In reference to design, there are four different aspects between desktop version websites and mobile websites (Google Developers, 2015; Meunler, 2012). For login mode, desktop version websites follow the normal website address input method whereas mobile devices can allow QR code scan/Direct login/Always logged in methods. In addition, desktop version websites have bigger screens while mobile devices have smaller screens. Moreover, desktop version websites have relatively higher screen resolution whereas mobile devices have relatively lower screen resolution. Nevertheless, compared with mobile websites, desktop version websites do not have separate URLs.

Although a number of previous studies have evaluated hotel website effectiveness through website functionality and usability (Bastida & Huan, 2014; Morrison et al., 2004; Sun et al., 2016), along with the popularity and the increasing number of the smartphones users for hotel reservations, mobile website design received limited attention. Based on the differences of the content and design for desktop version websites and mobile websites, the first question of the present study is what are the perceptions of consumers in terms of mobile functionality (i.e. hotel reservation information delivered by smartphones) and mobile usability (i.e. design) of smartphone

hotel reservation? In addition, mobile payment has already become a common practice among users in China, and the trend is continuous in terms of mobile payment for hotel reservations. Moreover, customer satisfaction is vital to attract consumers to rebook a hotel, and is positively connected with repurchase intention (Jarvis, Stoeckl, & Liu, 2016). Also, previous studies confirmed that compared with first-time users, repeaters can be regarded as information channels, linking their friends and relatives, and are more likely to return (Jarvis et al., 2016; Lau & McKercher, 2004). Nonetheless, although the relationship between customer satisfaction and repurchase intention has been extensively examined by previous studies (Oh, Oh, Kim, & Kim, 2017; Su, Swanson, & Chen, 2016), with the rapid penetration of smartphone usage, whether this relationship is applicable to the context of mobile payment for hotel reservations is not clear. Thus, the second question is how do functionality and usability toward mobile payment for hotel reservations affect the repurchase intention of hotels?

The main research questions are advocated based on the consumer decision-making process. In total, five stages are included in the purchase behavior of consumers (Engel, Blackwell, & Miniard, 1990). The initial stage is need recognition, followed by information search stage. After that, consumers start to evaluate the alternatives. Hence, this stage is called alternatives evaluation stage. Finally, the consumer makes the purchase decision. This stage is regarded as the stage of purchase. Last but not least, consumers may choose to repurchase or not to repurchase after the purchase decision of this time. Thus, the final stage is called the stage of post-purchase behavior. As indicated in Figure 2, when applying consumer decision-making process to mobile hotel reservations, before consumers make any decision, their needs will be recognized first. In early 1970s, Wright (1975) had already mentioned that it requires a considerable degree of cognitive effort before making any decision. In the present study, stage 1 refers to the needs of consumers to

book hotels via their smartphones. After consumers have such need recognition, they will start to search for hotel-related information through OTAs (i.e. stage 2). After consumers search for a variety of information, they will evaluate the alternatives because in most cases, decision-making is not the moment choice, it is an extensive processing of information (Hoyer, 1984). Stage 3 is an evaluation of different hotels. In stage 4, the evaluation results of alternatives will finally lead to the purchase decision of consumers (i.e. make hotel reservation). The consumer decision-making process has not ended yet. After consumers complete the transaction, they will consider the next purchase (i.e. stage 5). That is, consumers may choose to repurchase the hotels, or they may not repurchase again.

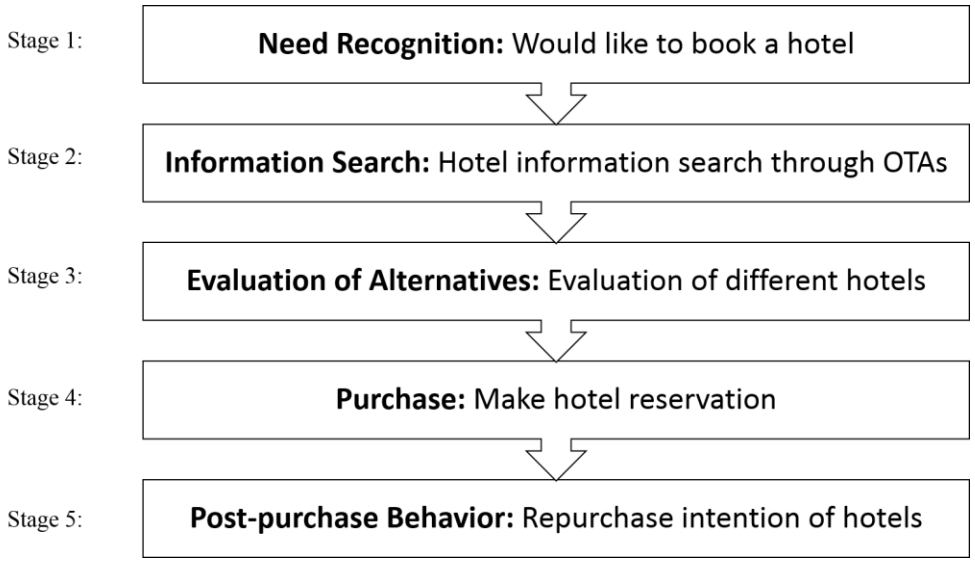


Figure 2. Application of consumer decision-making process for hotel reservation

According to Law, Buhalis, and Cobanoglu (2014), stage 3 (i.e. evaluation of alternatives) to stage 5 (i.e. post-purchase behavior) are most decisive stages in the decision making process of consumers. Thus, the present study investigates hotel-booking process from stage 3 to stage 5. Within the context of mobile hotel reservations, evaluating mobile functionality and usability

belongs to stage 3, that is, evaluation of hotel booking information. The proposed research framework covers stage 4 and stage 5, that is, hotel reservation and repurchase intention of hotels. Therefore, research questions of the present study can be split into two parts.

The first research question is:

i. How effective is smartphones in delivering hotel-booking information? (Stage 3: Evaluation of alternatives)

The second research question is:

ii. What are the impacts of functionality and usability toward mobile payment for hotel reservations on the repurchase intention of hotels? (Stages 4 & 5: Hotel reservation and repurchase intention of hotels)

1.4 Significance of the study

1.4.1 Theoretical contributions

The present study is mainly based on theory of planned behavior, which is a fundamental theory to explain consumer behavior. Theory of planned behavior was applied to marketing discipline in most of the previous studies; and it is also adopted in hospitality and tourism to examine the revisit intention of consumers (Han, Hsu, & Sheu, 2010; Hsu & Huang, 2012). In the present study, consumer behavior denotes mobile payment for hotel reservations. For the topic hotel website evaluation, previous studies mainly adopted the conceptual model of website evaluation (Bai et al., 2008; Brida, Meleddu, & Pulina, 2012; Ip, Law, & Lee, 2011; Kim et al., 2011; Murphy, Moscardo, Benckendorff, & Pearce, 2011; Park, Phillips, Canter, & Abbott, 2011; Prayag & Ryan, 2011; Tao, Wu, Cheung, & Tong, 2011; Wong, 2011).

Nevertheless, if the present study only adopts website evaluation model, the detailed aspects of functionality and usability are not clear. Thus, the combination of website evaluation

model and theory of planned behavior can provide the detailed aspects of how attitude, subjective norms, and perceived behavioral control affect the repurchase intention of hotels. In other words, the present study develops a research framework that integrates a conceptual model of website evaluation to theory of planned behavior to investigate the detailed aspects of functionality and usability related to attitude, subjective norms, and perceived behavioral control. Specifically, attitude in the present study denotes the attitude of functionality and usability toward mobile payment for hotel reservations, subjective norms refer to subjective norms of functionality and usability toward mobile payment for hotel reservations, and perceived behavioral control mean the perceived behavioral control of functionality and usability toward mobile payment for hotel reservations. The present study also extends theory of planned behavior by applying it into the context of mobile payment for hotel reservations. Furthermore, the developed research framework can be served as a reference for future studies.

1.4.2 Practical contributions

Practically, the present study provides useful insights for hospitality practitioners to be informed of the performance of mobile hotel reservation through OTAs via smartphones. Understanding the performance of mobile hotel reservation via OTAs is of great importance because it assists hospitality practitioners in improving the performance, and satisfying the needs and demands of consumers. Thus, the present study first assesses the performance of smartphones in delivering hotel-booking information considering mobile functionality and mobile usability. The present study then investigates the impacts of functionality and usability toward mobile payment for hotel reservations on the repurchase intention of hotels. With such information, hospitality practitioners can be informed of how consumers perceive the quality of mobile hotel booking and improve the quality of hotel-booking information delivery via

smartphones. On the other hand, to be informed of how functionality and usability toward mobile payment for hotel reservations affect hotel repurchase intention can provides insights for hospitality practitioners to communicate with cooperating OTAs to improve mobile payment service, improve customer satisfaction, and enhance the repurchase intention of hotels. Furthermore, the potential significance of the findings beyond hospitality is the application of findings to other business sectors or other countries or regions by developing mobile commence (m-commerce), particularly meet the payment preferences of consumers, simplify and improve the payment process through functionality and usability, and ultimately increase the sales of m-commerce.

1.5 Objectives of the study

To answer research question i, the objective is:

i. To assess the quality of hotel-booking information delivered by smartphones.

For answering research question ii, the objectives are all within the context of mobile payment for hotel reservations:

ii. To test the mediating effects of attitude on the relationship between mobile functionality and customer satisfaction; and on the relationship between mobile usability and customer satisfaction;

iii. To test the mediating effects of subjective norms on the relationship between mobile functionality and customer satisfaction; and on the relationship between mobile usability and customer satisfaction;

iv. To test the mediating effects of perceived behavioral control on the relationship between mobile functionality and customer satisfaction; and on the relationship between mobile usability and customer satisfaction;

v. To test the mediating effects of customer satisfaction on the relationship between attitude and repurchase intention; on the relationship between subjective norms and repurchase intention; and on the relationship between perceived behavioral control and repurchase intention.

1.6 Terminologies and definitions

1. **Mobile functionality of hotel reservation:**

   Mobile functionality of hotel reservation in the present study denotes hotel reservation information delivered by smartphones.

2. **Mobile usability of hotel reservation:**

   Mobile usability of hotel reservation in the present study signifies the design displayed on smartphones for hotel reservation.

3. **Mobile payment:**

   Mobile payment in the present study refers to the third-party mobile payment for hotel reservations via smartphones through mobile network operators or wireless technologies under financial regulations in China.

4. **Functionality toward mobile payment:**

   Functionality toward mobile payment in the present study refers to mobile payment information of hotel reservation delivered by smartphones.

5. **Usability toward mobile payment:**

Usability toward mobile payment in the present study illustrates mobile payment transaction process for hotel reservation.

6. **Attitude toward mobile payment:**

Attitude toward mobile payment in the present study refers to either favorable or unfavorable attitude toward mobile payment for hotel reservations.

7. **Subjective norms toward mobile payment:**

Subjective norms in the present study denote what most people in his or her social network think whether he or she should use mobile payment for hotel reservations.

8. **Perceived behavioral control toward mobile payment:**

Perceived behavioral control in the present study reveals the ability of consumers to use mobile payment for hotel reservations.

1.7 Chapter summary

In summary, this chapter discusses the rapid development of information and communications technology, the increasing number of smartphone users of travel planning, the wide adoption of smartphones/mobile apps for hotel reservations, and the market penetration of mobile payment for hotel reservations in China. The significance of the present study is then identified, main research questions are stated; and the objectives of the present study are further illustrated.

Chapter 2. Literature review and theoretical background

2.1 Chapter introduction

Chapter 2 includes five main parts: the development of hotel websites, website functionality, website usability, theory of planned behavior, customer satisfaction, and repurchase intention. Under website functionality, mobile functionality is discussed. It is further divided into mobile functionality of hotel reservation, and functionality toward mobile payment. Similarly, under website usability, mobile usability is discussed. It is further categorized into mobile usability of hotel reservation, and usability toward mobile payment. Finally, the gaps are identified and summarized.

2.2 Development of hotel websites

Over the past decade, hotel guests booked hotel rooms through telephone, fax or through agents. In mid-to-late 1990s, both industry practitioners and academic researchers started to introduce and explore booking travel-related products through online platforms, such as hotel booking websites to facilitate hotel booking and to improve the efficiency (Bonn, Furr, & Susskind, 1998; Law & Hsu, 2006; Walle, 1996; Weber & Roehl, 1999). Hotels then started to establish their own websites to target hotel guests worldwide and enable them to access to the hotel information through the Internet. In the meantime, hotels tried to deliver high-quality service so as to build long-lasting relationships with consumers (Au Yeung & Law, 2004; Bai et al., 2008). Gradually, along with the wide adoption of the Internet and the ICT-related applications (e.g. travel-related websites), hotel managers have realized the benefits of these applications such as hotel information dissemination to consumers. In mid-to-late 2000s, more hotel and tourism websites were available. Despite providing basic information, hotel managers started to improve their websites, such as updating web technology to provide more convenience

and personalized service to consumers; and meanwhile, they started to streamline online hotel reservations (Baloglu & Pekcan, 2006). They also developed their brands by integrating branding strategy into the websites. Since 2010, hotel managers have been continuously improving their websites by adopting new business models or developing mobile apps to facilitate hotel reservations (Fong et al., 2017; Xiang, Wang, O'Leary, & Fesenmaier, 2014). Apart from using hotel's own official websites to sell hotel rooms, hotels also cooperate with third-party websites (e.g. OTAs) to gain more exposure of their hotel rooms so as to increase the volume of sales. Besides, social media websites have great influences on the reputation of hotels, and the hotel revenue in turn (Ladhari & Michaud, 2015).

From the perspective of suppliers, the usefulness of Internet applications such as websites can be easily recognized by the hotel industry for worldwide distribution of the products and service. From the perspective of consumers, they can search for travel-related information and access to hotel-booking information anytime at anywhere, as well as purchase hotel rooms along with the development of information and communications technology (Chung & Law, 2003; Park & Huang, 2017). Bhatiasevi and Yoopetch (2015) unearthed that four-star hotels and five-star hotels in Thailand started to change their strategy for marketing and sales. Specifically, they changed from heavily dependence on agents to the online booking system to facilitate direct worldwide hotel bookings; and the change of the sales strategy brought a 40% increase of hotel bookings. Nevertheless, oftentimes consumers compare the products from different distribution channels for a better deal (Chaffey, Mayer, Johnston, & Ellis-Chadwick, 2003; Spiliopoulou, 2000). That is, if the hotel booking information that is delivered to customers cannot meet their needs, they may quickly switch to other channels for their required information for hotel booking. The above statements indicate the rapid development of hotel websites brings

convenience to suppliers and consumers, but makes the competition fiercer locally and globally at the same time (Marcussen, 2008; Morrison et al., 2004). Hence, in order for hotels to be more competitive in delivering the information that is perceived useful to customers, website evaluation has been crucial for hotels to achieve the success of their business (Jeong, Oh, & Gregoire, 2003).

2.2.1 Website evaluation models from early to mid-1990s

Since the appearance of websites, website evaluation has become quite popular consequently, various approaches, either website evaluation models or tools have been adopted from early to mid-1990s to the present (i.e. 2018). In early to mid-1990s, the most influential management tool is the Balanced Score Card (BSC), which measures organizational performance beyond solely measuring financial performance. BSC encompasses four perspectives: "customer perspective", "financial perspective", "learning and growth perspective", and "internal business processes perspective" (Kaplan & Norton, 1992, p. 72). Meanwhile, BSC considers both the financial and non-financial aspects of a company's strategy (Kaplan & Norton, 1992, 1993; Morrison et al., 2004). For example, Murphy, Forrest, Wotring, and Brymer (1996) browsed the websites of 20 chain and 16 independent hotels and identified 32 website-related features. These features are then categorized into four categories: "promotion and marketing", "service and information", "interactivity and technology", and "management". The finding of this study indicated that the most effective hotel website is the one that has the easiest access to the relevant information. Cano and Prentice (1998) assessed 130 Scotland tourism promotion websites and results indicate that the performance of these websites varied to a great extent. Overall, these websites were underselling Scotland as a tourist destination. In late 1990s, Morrison, Taylor, Morrison, and Morrison (1999, p. 103) recognized that website performance evaluation is multi-

dimensional, and suggested a modified BSC approach by considering four perspectives: "technical perspective", "marketing perspective", "customer perspective" and "internal perspective" (Figure 3). This study then applied the modified BSC approach to assess small Scottish hotels and operationalized each perspective involved in BSC approach by identifying critical success factors.

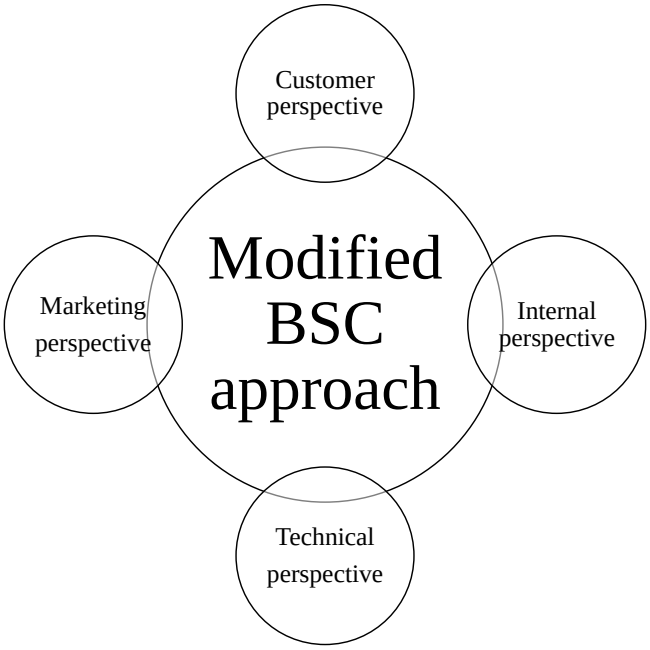


Figure 3. Modified BSC approach

Source: Morrison et al. (1999)

2.2.2 Website evaluation models in 2000s

After the modified BSC approach was advocated, some studies fully applied it while some other studies selected one or two perspectives among the four above-mentioned perspectives to apply. For example, Kim, Morrison, and Mills (2004) assessed the performance of the websites of U.S. convention centers from four perspectives and modified the critical success factors to match the needs of meeting planners. Yuan, Morrison, Linton, Feng, and Jeon (2004, p. 19) used the modified BSC approach to evaluate the small wineries in a mid-western

U.S. state from four perspectives: “technical perspective”, “customer perspective”, “winery internal perspective”, and “marketing and partnership”. The finding showed that these websites were found to be electronic platforms for information distribution rather than a platform for relationship management. Other studies applied the adjusted modified BSC approach, and tested the applicability of the adjusted modified BSC approach from marketing perspective because these studies perceive that the Internet changes the marketing most (Sigala, 2003; So & Morrison, 2004). Indeed, with the support of Internet marketing, the needs and demands of customers can be found out; and the relationships with customers can be better maintained and managed. For example, through conducting the content analysis to evaluate the marketing effectiveness of National Tourism Organizations (NTOs) in east Asia, the finding of So and Morrison (2004) showed that all these NTOs do not utilizing their websites to the maximization in their roles of marketing. Feng, Morrison, and Ismail (2004) compared the destination marketing websites (i.e. the U.S. and China) from marketing perspective (e.g. web page design) and found that U.S. destination marketing websites are doing much better than Chinese destination marketing website in terms of adopting marketing strategies and delivering marketing information. Some studies made other adjustments. For example, So and Morrison (2002) evaluated 14 national tourism organizations in eastern and southern Asia by using adjusted modified BSC approach. This study replaced the internal perspective by destination information while the other three perspectives remained the same. Similarly, Ismail, Labropoulos, Mills, and Morrison (2002) replaced the internal perspective to the cultural-related perspective to evaluate the marketing of culture aspect on the websites of European National Tourism Organizations (NTOs).

Nonetheless, although the modified BSC approach has been widely applied in hotel and tourism since 1999, it started to receive some criticisms in 2000s. For example, in the aspect of internal perspective, the information "ease of site maintenance" cannot be accessed ((Ismail et al., 2002). Chung and Law (2003) also criticized the study of Morrison et al. (1999) which fails to consider the perspectives of hotel managers in developing dimensions. Chung and Law (2003, p. 122) then developed a modified research framework to evaluate a hotel website by adding the views of hoteliers. The further developed model encompassed five dimensions: "facilities information", "customer contact information", "reservation information", "surrounding area information", and "management of websites". This further developed model was then applied to measure the performance of hotel websites in Hong Kong. Results revealed the significant differences of the dimensions among budget hotel websites, mid-priced websites, and luxurious websites. Morrison et al. (2004) argued that even though the modified BSC approach provides a comprehensive understanding of different dimensions along with the corresponding attributes, not all attributes can be included. Other criticism includes the questioning of whether there are any other viable perspectives can be included despite the four perspectives advocated by Morrison et al. (1999). Since then, new models and website evaluation approaches have been advocated. For example, Law and Cheung (2005) assessed the website performance by classifying travel websites into with or without users' involvement. Bai et al. (2008) tested how website quality affects customer satisfaction and purchase intention, and the finding showed that website quality positively affects customer satisfaction.

2.2.3 Website evaluation models in 2010s and 2015s

Since 2010, more approaches have been adopted for website evaluation. For example, Tsai, Chou, and Lai (2010) was the first study which applied the Decision-Making Trial and

Evaluation Laboratory (DEMATEL) and Analytic Network Process (ANP) to compute weights for each criterion to evaluate the national park websites in Taiwan. Finally, the VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) was applied to rank Taiwanese national park websites. The finding showed that information richness appears to be a vital factor to evaluate websites. Li and Wang (2011) applied the ICTRT (information, communication, transaction, relationship, and technical merit) model to evaluate the effectiveness of U.S. tourism websites. The findings showed that website function includes information and communication. Nevertheless, advanced functions (i.e. transaction, relationship maintenance) are not widely adopted. Díaz and Koutra (2013, pp. 339-340) evaluated six dimensions of website persuasiveness in terms of "informativeness", "usability", "credibility", "inspiration", "involvement", and "reciprocity" using a latent class segmentation analysis. Result demonstrated that four-cluster solution is the most coherent one. Zhong, Leung, Law, Wu, and Shao (2014) applied capability maturity model to evaluate attraction websites. Six key performance areas and 48 key criteria were identified. The results revealed that although e-commerence in China is in its rapid development stage, the development of attraction websites in China is still at an infancy stage. Chen and Lin (2015) examined the perceived fashionability by testing the hypotheses based on dual-system theories and social influence theories. The findings revealed that perceived fashionability positively affects the stickiness of users to use the website. Moreover, perceived fashionability mediates the relationship between website security and stickiness. Finally, a conceptual model was developed. Sun et al. (2016) used a new technique, that is, decision trees and Weka to pinpoint the critical factors that affect the quality levels of customer experience when they visit travel websites. The findings proved that when designing a travel website, information quality is regarded as the most important factor. Li, Wang, and Yu (2015) utilized

change propensity analysis to evaluate the future trends of website marketing activities. The finding indicated that the utilization of websites of U.S. hotels is limited. In other words, the hotel websites of U.S. only focus on the information dissemination.

On the other hand, some studies applied other methods to evaluate website performance. For example, Bai, Jang, and Hu (2003) developed a conceptual model to evaluate the e-relationship of hotel websites. Later, based on the framework advocated by Kotler, Bowen, and Makens (2003), Essawy (2005) developed an e-relationship framework to analyze the performance of UK-based national hotel websites. Result showed that exploiting the Internet as a marketing tool is still in early stage. Bauernfeind and Mitsche (2008) introduced the application of Data Envelopment Analysis (DEA), which includes the input criteria (e.g. interactivity) and output criteria (e.g. number of website visits) to access the website efficiency of tourism organizations. The finding revealed that useful benchmarking partners can improve the website efficiency of tourism organizations. Schmidt, Cantallops, and dos Santos (2008) evaluated hotel websites by classifying them into three categories: evaluation by phases, evaluation by characteristics, and evaluation by characteristics and effectiveness. The major findings showed that small-sized and medium-sized hotels in developing tourist destinations in Brazil and those in developed tourist destinations in Spain used their websites as marketing tools but the functions such as interactivity is ignored to some extent. Through an evaluation of 36 attributes, Dion and Woodside (2010) compared the website attributes of visa and non-visa destinations in terms of American tourism. The selected destinations are then compared and evaluated in terms of website quality, quantity, and utility. The finding revealed the deficiency of the aforementioned aspects of the private sector websites. Recently, Li et al. (2017, p. 5) investigated the influence of "usability", "ease of use", "entertainment", and "complementarity" on eTrust and the intention of

consumers for online hotel booking. The findings indicated that “usability”, “entertainment”, and “complementarity” have positive impacts on eTrust, and eTrust significantly affects the intention of consumers for online hotel booking.

In summary, starting from the basic BSC approach, different models and approaches have been applied for website evaluation, along with the rapid development of ICTs, particularly since 2010. Most of the previous studies on website evaluation is either qualitative or quantitative. Oftentimes, quantitative studies evaluated website performance by indicators or scores to assess the relationships between different dimensions and the overall quality of websites. As the study of Salavati and Hashim (2015) unearthed that ranking of the hotel page and the star rating of the hotel are tightly connected with website performance. Qualitative studies on the other hand evaluated the websites without indicators. For instance, through analyzing a series of national surveys, the findings of Xiang et al. (2014) discovered the growing “bifurcation” between traditional online travelers and those who have tried alternative channels to search for authentic experience. Similarly, as with the findings of Law, Qi, and Buhalis (2010), the present study also unearthed that previous website evaluation-related studies are in two directions: qualitative study and quantitative study, and quantitative studies are dominant for website evaluation studies.

Figure 4 shows the development of mainstream website evaluation models from 1990s to the present (i.e. 2018). During 1990s, most of the previous studies were based on the original BSC approach, the modified BSC approach, or the adjusted modified BSC approach. In 2000s, studies started to criticize the BSC approach, and new approaches such as diverse conceptual models were developed. Since 2010, ICT has been developing rapidly, and is increasingly playing an important role in consumers’ purchase decision of travel-related products. More diverse approaches such as decision trees and change propensity analysis have also been

advocated (Li et al., 2015; Sun et al., 2016). By contrast, a minority of studies applied other approaches such as operationalized research framework, e-relationship framework, and data envelopment analysis for website evaluation (Bai et al., 2003; Bauernfeind & Mitsche, 2008; Essawy, 2005). Although different models have been applied to evaluate website performance, website functionality (i.e. information) and website usability (i.e. design) are the two most common dimensions used to measure website performance as stated by Li et al. (2015) and Sun et al. (2016) that website performance largely affects the decision making of consumers, and this will ultimately contribute to the revenue of the organization.

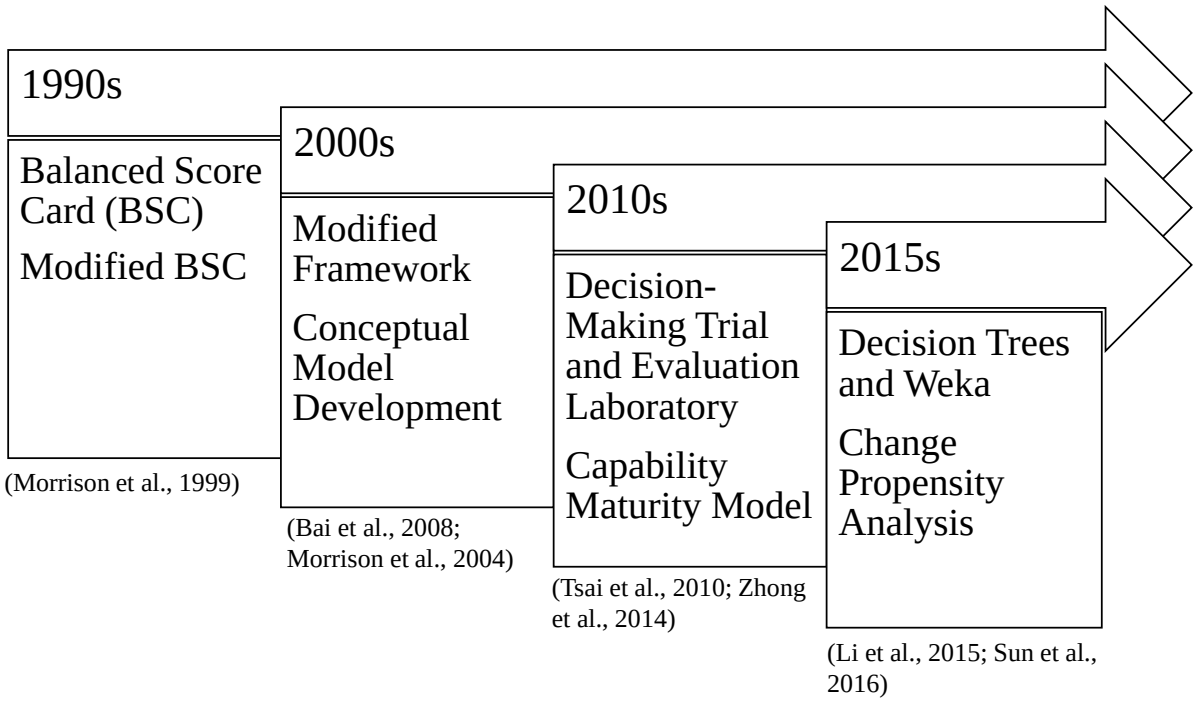


Figure 4. Development of mainstream website evaluation approaches

2.3 Website effectiveness and different terms of website functionality

In the initial stage of web application development, system feasibility, usefulness, and social acceptability have been taken into consideration (Lu & Yeung, 1998). When system gradually becomes mature, compared with system feasibility and social acceptability, usefulness plays the most important role among users, and functionality and usability are two major dimensions that measure usefulness. As Au Yeung and Law (2004) verified that functionality and usability are the major determinants of website performance evaluation. After 2000s, there was a widespread acceptance of the use of the Web for e-commerce as a low-cost distribution channel because of its profound benefits for both suppliers and consumers (Gilbert & Powell-Perry, 2001). Currently, Ting, Wang, Bau, and Chiang (2013) defined website functionality as the utilization of the Internet to provide personalized service to customers through updating web technology constantly.

Content is considered as one of the most important website design characteristics (Gretzel, Yuan, & Fesenmaier, 2000). Hence, along with the recent e-commerce development, it is of great importance for practitioners to take website functionality into consideration so that consumers can be adhered to e-tourism websites (Chen & Lin, 2018). For example, the findings of Kaplanidou and Vogt (2006) showed that destination websites can provide an instant source of information to potential travelers; and the information can satisfy the needs of customers of acquiring functional trip information so as to be better prepared for the trip. Ting, Kuo, and Li (2012) also unearthed that the importance of website content, which directly affects the preferences of consumers and their decision-making. Sun et al. (2016) further proved that information quality is considered as a vital attribute in designing the website of a travel agency. Recently, Hahn, Sparks, Wilkins, and Jin

(2017) also confirmed that reliable information is one of the most important attribute to evaluate hotel websites.

Since the present study investigates the websites that have been built already, which means that system feasibility and social acceptability have been achieved already, hence usefulness (i.e. functionality and usability) is what should be taken into consideration most. Website functionality refers to information provision whereas website usability denotes information use and processing (i.e. design). Unlike website usability, website functionality mainly evaluates website content and features (Chung & Law, 2003; Morrison et al., 2004). Content refers to the overall features of a website, and meanwhile, it is a vital factor to attract consumers to visit the websites (Cai, Card, & Cole, 2004). Content quality means that website context is accurate and informative. Meanwhile, the content of an effective website should be useful, comprehensive, and up-to-date (Musante, Bojanic, & Zhang, 2008). In the present study, functionality refers to the hotel booking information whereas usability refers to the design displayed on smartphones for hotel reservation.

Since 1990s, numerous studies have investigated website effectiveness, including website quality/website service quality, website features, and website characteristics. For example, Ham (2004) adopted a seven-criteria evaluation to evaluate website effectiveness, mainly considering information accessibility, content usefulness, navigation effectiveness and online reservations. The finding provided implications for hospitality practitioners to determine specific areas of website improvements. Han and Mills (2006) reviewed hotel and tourism-related website effectiveness literature and found out different instruments to evaluate websites. Moreover, result showed that the most obvious characteristic of evaluation instrument is informative. Later, Musante et al. (2008) evaluated 27 content items of hotel websites based on the star-rating of a hotel. The findings showed that in general website utilization and effectiveness have been

increased. Furthermore, significant differences are found between hotels in different classes. To be specific, compared with budget hotels, 3-star and 4-star hotels provide more complete content, and modest differences are found between 3-star and 4-star hotels.

Website quality/website service quality

In general, website is used for information delivery. In terms of website quality, Perdue (2002) tested the developed conceptual model for a resort website. The finding showed that the visual appeal of the website is considered as the most influential factor of resort website quality evaluation. Park, Gretzel, and Sirakaya-Turk (2007) tested the impact of perceived website quality on consumers' willingness to use online travel agencies. Through a survey of 311 local residents in the United States, several core dimensions were identified, and their impacts on the behavioral intentions of consumers were then tested empirically. Results showed that ease of use positively determines the willingness to use OTAs, followed by information delivery, responsiveness, and security assurance. Tsang, Lai, and Law (2010) evaluated website quality by considering navigability, speed of switching pages, useful links, and the ways of personalization. Fernández-Cavia, Rovira, Díaz-Luque, and Cavaller (2014) proposed a 12-parameter web quality index, mainly considering the amount of information delivered to consumers, the availability of different languages provision, the interactivity with consumers, and the possible mobile communications. Recently, a measurement scale was developed by the study of Hahn et al. (2017) to evaluate website quality, which includes six indicators. That is, apart from what was considered by previous studies such as the reliable information provision, the reviews of customers, and the emotional engagement of consumers were considered to evaluate website quality. Website service quality is another research direction of website quality evaluation. For example, Kim and Lee (2004) explored the underlying dimensions and compared Web service

quality dimensions between online travel suppliers and OTAs to explain the overall customer satisfaction level. Results indicated that they are quite similar in terms of content, information structure, ease of use, and security. Moreover, information content is found to be the most important dimension.

Website feature/characteristics

Despite evaluating website quality/website service quality, website feature is another expression that academic researchers use to evaluate website quality (Murphy et al., 1996). Rachman and Richins (1997) evaluated the websites of tour operators in New Zealand by identifying 43 website features, reviewing 50 websites, and determining the percentage of each feature involved in the websites. The finding showed that the main purpose of the websites of New Zealand tour operators is to provide logistical information. Similarly, Aladwani and Palvia (2002) used a 25-item instrument to present the key factors of website features from the perspective of consumers. Besides, website characteristics have also got extensive discussions. For example, Kaplanidou and Vogt (2006) applied technology acceptance model to evaluate the impact of tourism website features on the perceived usefulness of the website. The major finding indicated that trip information has an indirect impact on the travel intentions of tourists. The evidence from previous literature indicates that from the very early stage of website development (i.e. late 1990s) to late 2000s, the role of travel-related websites was mainly served as platforms for information dissemination. Moreover, within the context of e-commerce, website quality indicators mainly include content amount, information quality, site accessibility, navigation, and visual attractiveness, with website information as the most important attribute (Jahng, Jain, & Ramamurthy, 2000; Park et al., 2007; Perdue, 2001; Ting et al., 2012).

Information quality

When evaluating information quality, information in different aspects has been discussed. Some studies evaluated general information whereas other studies evaluated detailed information included in a travel website, such as lodging information (Chiou, Lin, & Perng, 2011; Hanai & Oguchi, 2008). For example, Chiou et al. (2011) provided general travel product information such as product variety, product details, and product comparison to evaluate a website. Hanai and Oguchi (2008, p. 36) provided detailed product information such as accommodation information, and the accommodation information is then classified into seven factors: "surrounding area", "transportation", "building", "service", "payment options", "price considerations" and "facilities". Albadvi and Saddad (2012) evaluated the product information from a different perspective. It considers both the general and detailed information. The general information includes a brief description, and detailed information mainly includes room rates and room photos. In summary, information quality gained much attention from academic researchers. According to Jeong and Lambert (2001), information quality of the website is vital in determining the decision-making process of consumers, and this study appraised the information quality of hotel websites. The findings indicated that perceived usefulness, perceived ease of use, perceived accessibility, and attitudes are good indicators to measure information quality and are indicators that affect the intention of consumers to use lodging websites. On the other hand, different criteria have been adopted to evaluate information quality. Fuld (1996) proposed three criteria to evaluate information quality of the website, considering information accessibility, information accuracy, and the added value of information. In addition, Ho (1997, p. 2) proposed a classification framework with three purposes and four categories. The three purposes include "promotion of product and services", "provision of data and information", and "processing of

business transactions". Four categories of value creation are "timely", "custom", "logistic", and "sensational respectively". Law and Hsu (2005) further examined the importance of specific dimensions and attributes with regard to information quality of hotel websites. The findings revealed that hotel-booking information is regarded as the dimension of great importance, while hotel room rate is considered as the most decisive attribute included in the dimension. Gradually, e-service quality has been taken into consideration. For example, Ho and Lee (2007) developed a measurement instrument by examining the essential dimensions of e-travel service quality. That is, information quality, security assurance of the website, functionality of the website, relationship maintenance with customers, and the responsiveness to address consumers' requests. Similarly, Tsang et al. (2010) explored six dimensions to appraise the e-service quality of OTAs by adding one evaluation criterion "appearance and presentation" apart from the five components considered by the study of Ho and Lee (2007).

In conclusion, along with the development of websites from late 1990s to 2015s, many different expressions have been used to describe the attributes of the websites from previous studies, with the ultimate goal of achieving website effectiveness (Han & Mills, 2006; Sun, Fong, Law, & He, 2017). From late 1990s to early 2000s, website quality is considered an important aspect by academic researchers, and website feature is the most commonly used expression when evaluating a website. In mid 2000s, website characteristic had become a popular expression to describe the attributes of a website. In 2010s, the expression website characteristic was still commonly applied whereas some studies prefer to use website features. In 2015s, website feature and website quality were commonly used to evaluate a website. In summary, regardless of different types of expressions that are adopted from previous studies, information quality plays the central

role, and is always the main focus of website evaluation (Aladwani & Palvia, 2002; Chiou, Lin, & Perng, 2010; Law, 2018; Ting et al., 2012; Tsang et al., 2010).

Specifically, in early stage (i.e. late 1990s), website quality or website service quality was discussed, and the main function of website was information dissemination. In early 2000s, with the rapid development of e-commerce, an increasing number of studies have identified different design features of web-based e-commerce system. In mid- to late 2000s, website features continued to gain attention from academic researchers, and website characteristics were considered as well. For example, Baloglu and Pekcan (2006) content analyzed site design characteristics (e.g. functionality, interactivity) of 4-star and 5-star hotel websites in Turkey and the corresponding marketing strategies. Result indicated that overall, the hotels in Turkey do not fully utilize the Internet for the effective electronic marketing. Later, the function of websites was not only for simply disseminating information but marketing as well (Bai, Hu, & Jang, 2007). For example, Bai et al. (2007) proposed a five-level e-Relationship marketing (e-RM) model and then tested it through examining web features of e-RM of more than 100 hotel companies. The findings specified that the hotels do not extensively utilize higher-level e-RM features (e.g. partnership and proactive) on their websites. Instead, hotels employ many lower-level (i.e. basic and reactive) features.

Since 2010s, some studies still used website features to describe website functionality. For instance, Salavati and Hashim (2015) evaluated website features from six perspectives. That is, hotel information, product information, service, payment information, customer relationship management, and hotel booking information. Meanwhile, evaluating website characteristics or website design characteristics was still a commonly applied website evaluation approach. For example, Giannopoulos and Mavragani (2011) examined website design characteristics from five

aspects, considering the visual appearance to the consumers, information quality and variety, perceived ease of use by consumers, personalization for consumers, and interactivity with consumers. Some more dimensions were added by the study of Tang, Jang, and Morrison (2012) which analyzed website characteristics by considering the loading speed, easiness of navigation, and website layout. Ting et al. (2012, p. 370) evaluated 158 hotel websites in Taiwan and China based on three dimensions: "feature breadth", "stage of website development", and "feature enrichment". The finding revealed that different types of hotels in Taiwan and China focus on the features of hotel websites differently. Bastida and Huan (2014) evaluated website information quality by classifying tourism websites (i.e. Beijing, Hong Kong, Shanghai, Taipei) information into three groups: information that tourists require before and during the trip, as well as the website itself. The finding showed that tourism website of Hong Kong is the best whereas that of Beijing has the most room for improvement. Furthermore, Panagopoulos, Kanellopoulos, Karachanidis, and Konstantinidis (2011) proposed a comprehensive model which combines various dimensions such as information attributes (e.g. language), website design attributes (e.g. navigation), and payment.

Measurements of website functionality

In the study of Lu and Yeung (1998), website usefulness evaluation includes two dimensions: website functionality and website usability. Nevertheless, some of the previous studies do not have a clear distinction between website functionality and usability. For example, Giannopoulos and Mavragani (2011, p. 722) examined website design characteristics from five aspects: "visual appearance", "quality and variety of information", "ease of use", "interactivity", and "personalization", which includes both website functionality (e.g. information) and website usability (e.g. ease of use). Specifically, quality of information refers to website functionality

whereas visual appearance, ease of use, and personalization refer to website usability. Similarly, although the purpose of the study of Ting et al. (2012) examined website content, it also includes website design attribute such as navigation (i.e. website usability) in their study. Law et al. (2008) has a clear distinction between website functionality and usability. In their study, website functionality refers to information whereas usability refers to design. This study investigated the perceived importance of travel website functionality and usability and the related attributes. The findings showed that no significant difference is found between e-buyers and e-browsers for the most included factors. Thus, in order to have a clear distinction between website functionality and website usability, functionality in the present study refers to information/content of hotel reservation only.

Table 2 summarizes the measurements of website functionality of previous studies based on the adjusted four levels of the study of Wang (2008). That is, *information level, communication level, transaction level, and relationship level.* Information level refers to the quality of information, as well as the diversity of information. Communication level denotes any mechanism that enhances the communications between suppliers and consumers. Transaction level is a regarded as a further step to consolidate the relationship, such as the transaction. Relationship level is considered as the higher-level function, which shows the possibility of a potential "marriage" between suppliers and consumers. An example is that consumers join the membership of OTAs such as Ctrip for hotel reservation, and then OTAs will send e-newsletters to consumers from time to time to promote hotels and encourage the repurchase (Li, Elliot, & Choi, 2010).

Table 2. Measurements of website functionality of hotel reservation

Website functionality of hotel reservation	**Measurements**	**References**
Information level	Images	Baloglu and Pekcan (2006)
	Information	Bai et al. (2008)
	Accurate information	Tsang et al. (2010)
	Comprehensive information	Li and Wang (2011); and Tsang et al. (2010)
	In-depth information	Tsang et al. (2010)
	Updated information	Baloglu and Pekcan (2006); and Tsang et al. (2010)
	Event calendar	Baloglu and Pekcan (2006); and Bastida and Huan (2014)
	Maps	Baloglu and Pekcan (2006); and Li and Wang (2011)
	Index page	Baloglu and Pekcan (2006)
	Weather forecast	Li and Wang (2011)
	Multilingual capabilities	Leung, Rong, Li, and Law (2013); and Li and Wang (2011)
	Multimedia	Baloglu and Pekcan (2006); and Bastida and Huan (2014)
	Personalization	Baloglu and Pekcan (2006); Li and Wang (2011); and Tsang et al. (2010)
	Richness	Leung et al. (2013)
	Well-arranged categories	Tsang et al. (2010)
Communication level	Be linked quickly	Ho and Lee (2007)
	Brochure request service	Li and Wang (2011)

	Change reservations	Tsang et al. (2010)
	Contact information	Baloglu and Pekcan (2006)
	Easy to maneuver	Baloglu and Pekcan (2006); and Bastida and Huan (2014)
		Bai et al. (2008)
	Be connected with others	Baloglu and Pekcan (2006)
	Easy to find wanted information	Tsang et al. (2010)
	Email newsletter	Li and Wang (2011)
	Feedback forms	Baloglu and Pekcan (2006); Li and Wang (2011)
	Frequently asked questions	Li and Wang (2011)
	Interactivity	Li and Wang (2011)
	Links to social media	Li and Wang (2011)
	Search function	Baloglu and Pekcan (2006); and Bastida and Huan (2014)
	User interface and navigation	Baloglu and Pekcan (2006)
Transaction level	Easy to complete a transaction	Ho and Lee (2007); and Tsang et al. (2010)
	Foreign currency converter	Alipay (2016); and Baloglu and Pekcan (2006)
	Online reservation	Tanrisevdi and Duran (2011)
	Quick to complete a transaction	Ho and Lee (2007)
Relationship level	E-card sending	Tanrisevdi and Duran (2011)
	Membership availability	Tanrisevdi and Duran (2011)

2.3.1 Development of mobile technology of hotel reservation

Mobile technology and its associated business, which is generically called m-commerce, has received remarkable growth. Since 2010, advances and improvements in mobile technologies have led to the increase of the number of mobile device users (Morosan, 2015). At present, smartphone and its associated apps have had a fast adoption and are increasing occupying the market share. Several hotel groups have announced the increasing amounts of mobile hotel reservations, indicating that hotel reservations are made through mobile websites or smartphone apps. In general, different hotel groups hold optimistic views on the future of mobile hotel reservations (Tnooz, 2014), and they also predicted that there is a high probability for travelers to switch from desktop computers to their mobile devices to book hotels (Wang & Xiang, 2012). Furthermore, along with the growth of smartphone usage, mobile apps have been increasing gaining popularity among users. Indeed, at present, an increasing number of smartphone users have started to use mobile apps for travel-planning (Wang & Xiang, 2012).

Mobile communication, as a new communications and marketing channel, is the essence for m-commerce. For other industries, mobile communications are regarded as added convenience for consumers, but for hospitality, it is regarded as an integral part of the overall experience of consumers (Ip, Lee, & Law, 2010). Mobile information technology, also known as mobile technology, utilizes media transmission to transfer different types of data, such as texts, videos, and audio files between suppliers and suppliers, suppliers and consumers, and consumers and consumers (Lu, Yao, & Yu, 2005; Oh, Lehto, & Park, 2009). From the perspective of suppliers, m-commerce, which depends on mobile technology, offers numerous promising market opportunities than existing e-commerce because of the inherent characteristics of “mobile”, and “convenience” (Siau, Ee-Peng, & Shen, 2001). Kim, Park, and Morrison (2008) proved that mobile

communications have become important and effective channels for tourism organizations. Buhalis and Law (2008) further added that mobile technology is an important agent to reflect the change in hospitality. Similarly, from the perspective of consumers, mobile technology not only provides the great flexibility for travelers to achieve their hierarchal needs for information, but also offers users the opportunity to access to the required information from any location at any time (Kim et al., 2008). Okazaki, Campo, Andreu, and Romero (2014) summarized the main perceived benefits of using mobile technology, which contains convenience, immediacy, and personalization, as well as entertainment.

Within the hotel industry, what makes m-commerce service ecosystem different from e-commerce (desktop computer/laptop-based computer) and traditional commerce are a series of distinct features, such as portability, ubiquity, and personalization (Chong, Chan, & Ooi, 2012). To catch up with the recent trends, studies have started to identify the impact of mobile technology on hospitality. Wang, Xiang, Law, and Ki (2016b) pointed out that mobile technologies are capable to fulfill the efficiency desires of users, to satisfy the entertainment needs of users, to assist users in time-critical arrangements making, and to achieve mobility-related situational needs. Several studies have examined the adoption of mobile ICT (Ha et al., 2012; Katz & Sugiyama, 2006; Morosan, 2015). For example, Kim et al. (2008) investigated the factors that affect the intention of users to use mobile devices. Results indicate that technology and trip experience significantly affect the perceived usefulness and perceived ease of use from the perspective of consumers. In addition, technology and trip experience have positive impacts on the adoption of mobile devices during travel. Wang and Wang (2010) examined mobile hotel reservation adoption and identified that the perceived information and system quality are critical factors, and they have significant impacts on the perceived value of mobile hotel reservations

from the perspective of consumers. Ha et al. (2012) found that hotel apps can personalize the unique preferences of consumers. After reviewing 164 top visitor attraction apps, Dickinson et al. (2014) revealed technical functionalities, ranging from basic web content delivery to mobile-based information delivery. Wang et al. (2016b) found that attributes such as ease of use, visual appeal, and safety and security can be used to measure the effectiveness of the smartphone app for hotel reservation. Morosan (2015) added that hotel m-commerce ecosystem facilitates a faster, more accurate and comprehensive, and personalized information flows between hotels and guests. In conclusion, the unique characteristics of mobile communications are convenience, personalization, flexibility, and in-time information access (Kim et al., 2008; Oh et al., 2009).

2.3.2 Mobile functionality of hotel reservation

Along with the recent trend of m-commerce, on the one hand, some hotel groups such as Hyatt and Intercontinental Hotel Group have already developed their own mobile apps, and on the other hand, OTAs such as TripAdvisor and Expedia and Hotwire also launched mobile apps for more hotel reservations (Wang et al., 2016b). Although previous studies have discussed website functionality for hotel reservations (Chen & Lin, 2018; Li et al., 2017; Park et al., 2007; Zhang & Von Dran, 2002), limited studies investigated mobile functionality for hotel reservations. For example, the findings of Murphy et al. (2016) showed that mobile-friendly content delivered by OTAs has the potential for achieving its popularity, and thus content design and information structure should not be solely based on the delivery of desktop version websites. Hence, hotels at present also integrate mobile communication platforms to provide different kinds of services to hotel guests, such as online check-in for hotel rooms, hotel room upgrades, and loyalty program joining (Adukaite, Reimann, Marchiori, & Cantoni, 2014; Anuar, Musa, & Khalid, 2014).

Mobile functionality of hotel reservation in the present study refers to hotel information delivery via smartphones. When consumers use smartphones for hotel reservations, they either browse the websites or mobile apps. According to Murphy et al. (2016), smartphones have been increasingly used for information sharing of hotel reservations. In total, there are three types of mobile websites. The first type is the simple transformation from desktop version websites to mobile platforms supported by smartphones. The second type is known as mobile user-friendly websites. Rather than the direct transformation from desktop version websites to mobile website platforms, some OTAs launched websites that are particularly designed for mobile devices (e.g. smartphone). The third type is information delivery through mobile apps, as Dickinson et al. (2014) unearthed that an important feature of smartphones lies in the availability of mobile applications, which are known as apps. Apps refer to the application of the software, which can be tailor-made for mobile devices, such as smartphones or tablets. Overall, mobile devices and their associated apps improve the efficiency of information delivery and achieve the customer personalization to a large extent.

For the present study, only smartphones are considered because of its wide adoption. In general, hotel-related mobile apps are aimed at transferring most of the hotel-related information that is available on desktop version websites to mobile platforms (Adukaite et al., 2014; Wang & Xiang, 2012). Moreover, by using hotel apps, hotels can assist hotel guests in achieving personalization (Morosan, 2015). For example, Park et al. (2007) identified the underlying dimensions to evaluate travel agencies such as user satisfaction, the reliability and fruitfulness of information, customer service effectiveness, safety and security, and design and layout. OTAs share the similarities with hotel-related mobile apps in many ways, and they mainly provide information to consumers and facilitate hotel reservations. For instance, Wang et al. (2016b)

investigated the features of smartphone apps (i.e. OTA app, hotel brand app) for hotel room booking. The finding indicated that the basic function of mobile apps is to make hotel reservations.

Similar to website functionality, mobile functionality also has four levels of information: information level, communication level, transaction level, and relationship level. In reference to information level, mobile websites or mobile apps are regarded as information distribution channels. According to Wang et al. (2016b), the quality of information available on mobile devices is reflected in the aspects of “reliable”, “complete”, and “up-to-date”. With regard to communication level information, it involves some communications between suppliers and consumers despite hotel information delivery only. For example, comScore (2012) stated that top mobile activities related to hotel reservations are hotel address search, hotel price compare, and hotel room booking. Wang, Xiang, and Fesenmaier (2016a) indicated that positioning has also been applied to mobile services at present. Limited studies have discussed the transaction level information. According to Wang and Xiang (2012) and Wang et al. (2016b), at present, smartphone apps not only provide hotel-related information but also act as translators, social and entertainment devices, and transactions. Consumers can even communicate with hotel customer service via mobile apps. Regarding the highest level relationship level information, Anuar et al. (2014) indicated that mobile platforms, particularly smartphones, act as the role of distributing product information as well as establishing relationships with customers. Wang et al. (2016b) also found that interactions with others can help tourists search for relevant information before they travel to a certain destination. Moreover, the potentiality of integrating social network elements into mobile platforms is huge. The findings also showed that consumers generally perceive OTA apps more favorable than the own apps of hotels because OTA apps are superior in

integrating comments and reviews of consumers, social networking and mapping functions. Table 3 summarizes the measurements of mobile functionality of hotel reservation in four levels based on previous literature.

Table 3. Measurements of mobile functionality of hotel reservation

Mobile functionality of hotel reservation	Measurements	References
Information level	Contact information	Baloglu and Pekcan (2006)
	Location	Baloglu and Pekcan (2006)
	Hotel property	Baloglu and Pekcan (2006)
	Hotel room	Baloglu and Pekcan (2006)
	Pictures	Baloglu and Pekcan (2006)
	Types	Agyeiwaah, Adongo, Dimache, and Wondirad (2016)
	Restaurant	Wang et al. (2016b)
	Spa	Wang et al. (2016b)
	Reservation information	Baloglu and Pekcan (2006)
	Price	Baloglu and Pekcan (2006)
	Quality of information	Wang et al. (2016b)
	Complete	Wang et al. (2016b)
	Reliable	Wang et al. (2016b)
	Up to date	Wang et al. (2016b)
Communication level	Address users' request	Baloglu and Pekcan (2006)
	Availability of hotel reviews	Wang et al. (2016b); and Ye, Law, and Gu (2009)
	Click to call	Wang et al. (2016b)
	Promotions	Baloglu and Pekcan (2006)
Transaction level	Mobile check-in	comScore (2013)
	Mobile check-out	comScore (2013)
Relationship level	Comments	Wang et al. (2016b)
	Rating	Wang et al. (2016b)
	Social network integration	Wang et al. (2016b)
	Loyalty program account access	Wang et al. (2016b)

For the present study, 22 attributes are included to measure mobile functionality of hotel reservation based on the adjustments of previous studies. Nine attributes, hotel room types, pictures, price, location, contact information, check-in information, and check-out information, change policy, and cancellation policy are used to measure mobile functionality in information level (Baloglu & Pekcan, 2006; Law, Chan, & Goh, 2007; Toh, Raven, & DeKay, 2011; Ye et al., 2009). Change policy and cancellation policy are added to make the policy part more comprehensive. Four attributes, address requests, have access to hotel reviews, promotions, and 24-hour customer service are adopted to measure mobile functionality in communication level (Baloglu & Pekcan, 2006; Wang et al., 2016b; Ye et al., 2009). Click to call is replaced by 24-hour customer service because in China, 24-hour customer service is commonly adopted by OTAs. Although in the study of comScore (2013), two attributes mobile check-in and check-out are used to measure mobile functionality of transaction level information, in China, if consumers make hotel reservations via OTAs rather than the own websites of hotels, mobile check-in and check-out services are not available. Thus, quick to complete hotel reservation and easy to complete hotel reservation are used to measure transaction level information within the context of mobile payment for hotel reservations in China. Furthermore, four attributes, comments, rating, social networking, and loyalty program account access are used to measure mobile functionality for relationship level information. Finally, three attributes, reliable, complete, and up to date are used to measure the overall quality of hotel information (Wang et al., 2016b).

2.3.3 Functionality toward mobile payment

The concept of online payment was advocated in early 2000s, and later online payment system has been gradually widely applied into people's daily activities because it largely minimizes the human effort for remote purchase (Gupta & Dhariwal, 2017). For example, Park and Kim (2003) investigated the relationship between online shopping characteristics and the purchase behavior of consumers, and result indicated that information quality and the quality of user interface significantly affect the actual purchase behavior of consumers. Nonetheless, problems that are related to payment tools' compatibility with online merchants, safety and security issue such as personal information disclosure started to occur in 2010 (Chen & Liao, 2011; Gupta & Dhariwal, 2017; Hsieh, 2001; Lowry, Wells, Moody, Humphreys, & Kettles, 2006). Since then, studies started to focus on the ownership of the content, compatibility issue, as well as safety and security issue. For example, Chen and Liao (2011) proposed an intact arbitration mechanism to protect the legal ownership of consumers and ensure the safety and fairness of the trading between consumers and suppliers. To deal with the main concerns of the security issue of personal information disclosure, Reddy and Anusha (2015) proposed a novel approach by providing limited necessary personal information for successful transaction; and thereby safeguarding the data of consumers. Rajendran and Nair (2017) further introduced the application of combing steganography, visual cryptography, and least significant bit (LSB) encryption to create a reliable online transaction platform. The finding revealed that from the perspective of consumers, they prefer paying online purchases using credit card rather than creating a new online payment service account.

Online e-payment system is of great importance for the further development of e-commerce (He, Duan, Fu, & Li, 2006), and recently Grüschow and Brettel (2018) further

strengthened that a credit-efficient payment system is considered as a critical success factor for e-commerce such as online retail sales (Park & Kim, 2003). Nonetheless, the perception of consumers toward the risk of online transaction is a major concern of those who are hesitating to adopt online payments. The perceived risks of consumers are based on the trust that is built up during their first-time transactions among Chinese (Yang, Pang, Liu, Yen, & Tarn, 2015). In other words, online payment on the one hand brings convenience to consumers to a large extent, but on the other hand the risks such as the personal information disclosure involved may come along with. Hence, it is of great necessity to evaluate online payment from functionality and usability to ensure the seamless online transaction.

Transition from online payment to mobile payment

Starting from 2015s, there was an obvious transition from online payment to mobile payment because of the dependence of smartphone devices of consumers as Research director, James Wester, from Worldwide Payment Strategies at International Data Corporation (IDC) Financial Insights pointed out that "Consumers are becoming more dependent upon their mobile devices, including using them to search, shop, and pay." (Wester, 2016b, p. 1; Zhou, 2015). The earliest form of mobile payment is based on short messages. For example, the service provider sends a short message to inform the users about the charges. Once the users confirm the message (i.e. accept), then the fees will be charged from their accounts. Later on, users started to take advantage of wireless application protocol (WAP) sites or client-end applications to conduct mobile payment (Zhou, 2013). Unlike Internet payment services, mobile payment can be regarded as a special form of the electronic payment handling. In general, the key characteristic of mobile payment that distinguishes itself from other forms of payment methods is that it allows the users to adopt mobile terminals such as smartphones to make mobile payment (Dahlberg,

Mallat, Ondrus, & Zmijewska, 2008). Moreover, mobile payment depends on the effective collaboration between financial institutions and mobile network operators (MNOs). In other words, mobile payment is considered as the integration of the functions of communication networks of MNOs with the payment accounts of financial institutions.

Mobile payment forms

Mobile payment is evolving, and the trend is continuing to grow at a global level. According to Research and Markets (2016), almost 50% of the mobile Internet users have already adopted mobile payment service. From a global perspective, mobile payment has three main forms: remote mobile payment (i.e. third-party mobile payment), proximity mobile payment (also known as contactless mobile payment), and peer-to-peer/person-to-person (P2P) transaction (Chandra, Srivastava, & Theng, 2010; Research and Markets, 2016; Simont Braun, 2016). Remote mobile payment, known as third-party mobile payment, occurs when the user is remote to the retailer. Proximity mobile payment (also known as contactless mobile payment) commonly depends on the technology of Near Field Communication (NFC), Host Card Emulation (HCE), and Bluetooth BLE Smart Payment (BLE), or even a more advanced technology called Ratio Frequency Identification (RFID) (Wirecard, 2016). The aforementioned technologies can allow an object to be identified uniquely through radio waves. Peer-to-peer/person-to-person (P2P) transaction is known as an online technology, which has two approaches in general (InvestingAnswers, 2016). The first approach is PayPal approach. For this approach, an account has to be established with a third-party vendor, with bank account/credit card information provided. Through using the platform from third-party, users can complete the transaction, which can be either sending or receiving funds. For the second approach, users use the mobile application developed by financial institution/bank, and designate the amount that

needs to be transferred. Once the sender initiates the transfer, the recipient will receive the notification of the sender and the requirement of bank account information input to complete the transaction. In this case, the recipient does not need to have a bank account, which is the same as the sender.

Several companies, Alipay, WeChat Pay, Google Wallet, Apple Pay, and Samsung Pay are dominating the mobile payment market of the aforementioned three mobile payment forms in China. Alipay and WeChat Pay dominate the remote mobile payment in China (CCTV, 2016). Apple Pay and Samsung Pay are the two main players of proximity mobile payment, and they are popular in the United States. Starting from early 2016, they have become quote popular in Asia-Pacific regions such as China and Korea as well (Boden, 2017; Quah, 2016). Regarding P2P transaction, Google Wallet, which dominants the P2P mobile payment service was initially launched in 2011, and is at present widely adopted in the United States. Later in 2013, with the integration of Gmail, it extended its service to the United Kingdom (Google Wallet, 2016). In reference to the current adoption of mobile payment worldwide, in advanced regions such as Europe and North America, proximity mobile payment occupies the main markets in UK and France. By contrast, in Germany, P2P mobile payment was the most well-known mobile payment method in 2015. It is predicted that by 2018, P2P mobile payment will be the most widely adopted mobile payment method in the United States (Wester, 2016a). At present, Asia-Pacific region is leading the growing market of mobile payment, particularly China. Furthermore, even for undeveloped region such as Africa, mobile payment is on the rise.

Mobile payment in China

Mobile payment, the revolution of electronic payment, is defined as the payment that relies on mobile device to complete a commercial transaction (i.e. initiate, authorize, and confirm) (Au & Kauffman, 2008). According to Dahlberg et al. (2008, p. 1), mobile payment is defined as "payment for goods, services, and bills with a mobile device such as mobile phone, smartphone, or personal digital assistant by taking advantage of wireless and other communication technologies." Based on Ghezzi, Renga, Balocco, and Pescetto (2010, p. 5), mobile payment is "a process in which at least one phase of the transaction is conducted using a mobile device (such as mobile phone, smartphone, PDA, or any wireless enabled device) capable of securely processing a financial transaction over a mobile network, or via various wireless technologies (e.g. NFC, Bluetooth, RFID)." Some studies focus on mobile phones, while other studies consider all mobile communication devices (Henkel, 2002; Ozturk, Bilgihan, Nusair, & Okumus, 2016). In the present study, only smartphones are considered, other mobile devices such as tablets are not considered. Moreover, only third-party mobile payment is considered because of its high penetration rate and its dominance in China. Based on the definition of previous studies and the topic mobile payment for hotel reservations that the present study intends to investigate, the definition of mobile payment in the present study is "*third-party mobile payment for hotel reservations via smartphones through mobile network operators or wireless technologies such as NFC and RFID under financial regulations in China*".

In China, three principle mobile payment models are commonly utilized. That is, "mobile network operator centric", "financial institution centric", and "third-party operator centric" models. Mobile network operator centric model means mobile network acts as the central node and manages the transactions. It is the most commonly adopted model. Regarding financial

institution centric model, the bank acts as the central role. In reference to third-party operator centric model, a third-party is the intermediary between financial institutions and operators. Mobile payment service in China is successful because the mainstream banking institutions and MNOs are monopolies in China, hence they have very strong bargaining power in the mobile payment market (Lu, Yang, Chau, & Cao, 2011). Two popular mobile payments in China contain remote payment and proximity payment. The first type, remote payment requires users to connect remote payment servers, such as mobile banking and mobile Internet payment service. It is often conducted remotely via mobile Web, direct-to-subscribers' bill or credit cards (Kim, Mirusmonov, & Lee, 2010). The second type, proximity payment, allows users to use mobile payment via their mobile phones on the spot. Technologies such as RFID and NFC are needed in this case. Mobile payment, the evolution of mobile technology, has become increasingly popular and commonly adopted in people's daily life, and has significantly changed people's payment habit. Meanwhile, smartphones provide higher capacity for communication and connectivity compared with early generations of mobile technologies because they not only provide information, but also assist consumers in completing the whole transaction process (Want, 2009). The hotel industry also observed the accelerated transformations of personalization based on m-commerce, such as location/positioning services, rich consumer profiling, particularly mobile payment (Morosan & DeFranco, 2015).

Measurements of mobile payment toward functionality

A majority of previous studies have investigated the topic about the intention of consumers to adopt mobile payment and further explored the factors that affect the intention of consumers to adopt mobile payment (Lu et al., 2011; Oliveira, Thomas, Baptista, & Campos, 2016). For example, based on the trust transfer theory, Lu et al. (2011) investigated how trust

beliefs affect mobile payment service adoption of consumers and the results specified that trust indeed has a significant impact on the cross-environment relationship; and significantly influences the intention of consumers to adopt mobile payment. Furthermore, since mobile payment has been receiving growing attention worldwide, Oliveira et al. (2016) proposed a new model by combing the extended technology acceptance model with diffusion of innovations and perceived security through structural equation modeling. The major finding showed that compatibility and perceived technology security significantly affect the adoption of users and their recommendation intention. Liébana-Cabanillas, Muñoz-Leiva, and Sánchez-Fernández (2018) investigated the acceptance of mobile payment systems by integrating trust, and perceived risk into technology acceptance model and proved the impacts of age, gender, and experience of consumers on the acceptance of mobile payment systems.

Nevertheless, functionality toward mobile payment, which refers to mobile payment information delivered by smartphones, has gained limited attention from academic researchers despite the wide adoption of mobile payment at present. For example, the findings of Liu et al. (2000) and Kim and Lim (2001) revealed that system quality and information quality have positive impacts on customer satisfaction in online purchase. Park et al. (2007) also identified that hotel-related information quality delivered by smartphones, such as information richness positively affects customer satisfaction. In addition, the finding of Bai et al. (2008) showed that website quality directly and positively affects customer satisfaction. Result of Zhao, Lu, Zhang, and Chau (2012) further proved that mobile value-added information quality significantly and positively affects customer satisfaction. Furthermore, Zhou (2013) identified that information quality and service quality affect the flow, and the main factor that affects customer satisfaction is system quality.

Mobile payment, as an evolution of mobile technology, can greatly satisfy the diverse needs of consumers, such as simple transaction (eMarker, 2014). Moreover, it assists consumers in time-critical arrangements making and mobility-related situations' catering, greatly decreases the transaction time, and achieves automate transaction (Karnouskos, 2004; Wang et al., 2016b). Referring to the measurements of functionality toward mobile payment, cross-border payment is regarded as important mobile payment information. The premise of the wide acceptance of mobile service is the possibility of making cross-border payment almost as easy as local payment. In addition, cross-border payment can be done without considering the user location (Karnouskos, 2004). Alipay, the most widely accepted third-party mobile payment method in China, has both cross-border website payment and cross-border mobile payment service (Alipay, 2016). Mobile payment procedure such as the provision of mobile payment flow is also regarded as important information for consumers (Figure 5).

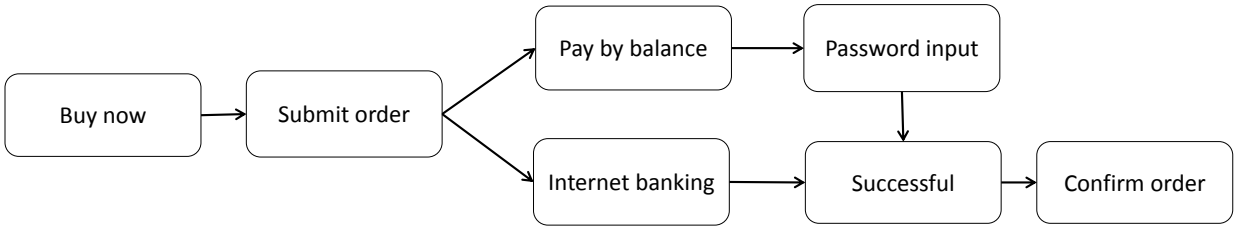


Figure 5. Mobile payment flow chat

Source: Alipay (2016)

Oftentimes, mobile websites provide detailed flow chat, including information about how to complete mobile payment. Currency information is also provided (Alipay, 2016). After completing the mobile payment transaction, the merchants will provide instant payment notification (IPN). IPN notifies merchants almost immediately about transaction events such as payment received, credit card authorization, and refunds. Merchants then send the confirmation email/message to the users, and also email/message a shipping list to consumers based on the information they receive (Paypal, 2016). Based on the previous literature, attributes under the dimension functionality toward mobile payment are summarized in Table 4.

Table 4. Measurements of functionality toward mobile payment

Functionality toward mobile payment	**Measurements**	**References**
Cross-border payment	Purchase goods on local/international partner merchant websites	Alipay (2016)
	Purchase goods on international/local websites when abroad	Alipay (2016)
Currency	Information of currency	Alipay (2016); and Baloglu and Pekcan (2006)
Mobile payment procedure	Mobile payment flow/steps	CyberSource (2015)
Speed/Time	Information about time it takes to complete the whole mobile payment procedure.	Karnouskos (2004)

2.4 Definition and evaluation of website usability

Website usability has been defined in many ways. Nielsen (1993, p. 1) believed that usability has five attributes: “learnability”, “efficiency”, “memorability”, “low error rate”, and “satisfaction”. Later, he considered usability as a quality attribute to assess or evaluate the ease of use of user interfaces, and provided four parameters of usability, that is, content, credibility navigation, and response time (Nielsen, 2000; Nielsen, 2003). At present, according to the standard of ISO-9241 Part 11, website usability has been defined as “the extent to which a system can be used by specified users to achieve a specified goal with effectiveness, efficiency, and satisfaction in a specified context of use.” (Userfocus, 2015, p. 1). The adoption of new technology has been constantly applying into information and communications websites (Ting et al., 2012). Embraced with the integration of new technology, website design is more diverse compared with previous versions because depending on the multimedia, a website can diversify the types of the content. In this way, customer satisfaction can be improved to some extent when they visit websites (Otondo, Scotter, Allen, & Palvia, 2008; Sun & Cheng, 2007).

Although according to Nielsen (1993), content is also one parameter of website usability, in the present study, website usability only refers to website design. Previous studies indicated that e-commerce primarily focused on website usability (Law & Hsu, 2006; Tsai et al., 2010). For example, Bai et al. (2008) and Qi, Law, and Buhalis (2008) evaluated website usability considering the general usability, specific language and information architecture, layout of the website, and the navigation and user interface. Kim and Kim (2008) provided four different categories to evaluate website usability. That is, website usefulness, website effectiveness, website supportiveness, and customer satisfaction. Agarwal and Venkatesh (2002) provided five categories of website usability evaluation, and mainly considered information provision and ease

of use perceived by consumers. On the other hand, Hassan and Li (2005) focused on different aspects to measure website usability, such as the consistency of screen appearance, interaction with consumers, and the use of media. The findings of Au Yeung and Law (2004) revealed that chain hotels have better performance compared with independent hotels in terms of website usability (i.e. website design). Kaplanidou and Vogt (2006) stressed the importance of providing flow chart (i.e. site map), and regarded it as a foundation of a good navigation system. That is, how each section (i.e. all major and minor sections of the websites) links to other sections and home page. Table 5 summarizes the measurements of website usability measured by previous studies.

Table 5. Measurements of website usability of hotel reservation

Website usability of hotel reservation	Measurements	References
Accessibility	Easy to find information	Evans and King (1999); and Kaplanidou and Vogt (2006)
	Speed	Evans and King (1999); and Kaplanidou and Vogt (2006)
Ease of use	Easy to use	Kim and Kim (2008)
Layout	Ease of physical access	Baloglu and Pekcan (2006)
	General	Bai et al. (2008)
	Layout and graphics	Bai et al. (2008)
	Visual/graphical representation	Kaplanidou and Vogt (2006)
Links	Relevant links provided	Baloglu and Pekcan (2006)
Navigability	Ease of navigation	Bai et al. (2008); Kaplanidou and Vogt (2006); Nielsen (2000); and Nielsen (2003)
Relevancy	Intended search information	Kaplanidou and Vogt (2006)
Search filter and sort	Search function provided	Wang et al. (2016b)
Security	Safety certificate	Credit Union National Association (2013)

2.4.1 Adoption of smartphones for hotel reservations

Since 2010, consumers rely more on smartphones than on desktops when they search for travel-related information because of the convenience of the personalization functions (Eriksson, 2014; Tnooz, 2014; Wang et al., 2016b; Wang & Wang, 2010). The report of Google (2013) revealed that customers demand fast download speed, customized webpage design, as well as good compatibility between mobile apps and their mobile devices. To follow the emergence and the high market penetration of mobile technology, some studies have investigated the mobile usage among users (Peres, Correia, & Moital, 2011; Wang, Park, & Fesenmaier, 2012; Wang & Xiang, 2012). For example, Peres et al. (2011) and Wang et al. (2016a) investigated the intention of consumers to use the smartphones. Nevertheless, although most researchers predicted the accelerated growth of mobile applications and the capacity of mobile technology, the detailed aspects of usability of smartphones are not indicated clearly (Wang et al., 2012; Wang & Xiang, 2012).

Nonetheless, it is inherently challenging and it is not easy to develop an all-in-one m-commerce ecosystem because of the inborn characteristics of m-commerce (e.g. perceived low security, small device size) (Ha et al., 2012). Hence, perceived barriers exist toward the use of mobile technology. For instance, Eriksson (2014) found out that when tourists use mobile technology during their trips, the perceived barriers are the cost of usage, and the issue of safety and security. After investigating 476 Spanish travelers, Okazaki et al. (2014) examined the travel-related mobile Internet services that are provided for respondents to involve in planning and executing a trip. The findings showed that Spanish respondents can be classified into four segments: ‘‘savvies”, “planners”, ‘‘opportunists”, and “low-techs”. Specifically, savvies tend to be heavy mobile device users both before and during their trips whereas planners tend to heavily

use mobile devices before their trips. By contrast, the opportunists use their phones and tablets only when they arrive at a destination. Low-techs in general do not participate in the mobile Internet travel planning. In summary, mobile technology assists consumers in different stages of travel, although security is a major concern when consumers use mobile technology identified by previous studies (Eriksson, 2014; Okazaki et al., 2014).

2.4.2 Mobile usability of hotel reservation

M-commerce facilitates consumers in communicating with merchants anywhere at any time because of the mobility of smartphone. Sensors such as gyroscopes, GPS, digital compasses, and proximity sensors can contribute to the development of adaptive systems and effective operations. In addition, along with the development of power-efficient processors, smartphone apps offer a number of possibilities for travelers to use mobile technology at home and on the away with modern and compatible operating systems, and user-friendly interfaces. In other words, smartphone's space-time capabilities can respond to the needs of individualized users (Höpken, Fuchs, Zanker, & Beer, 2010). When applying the use of smartphone to hotel reservations, it allows consumers to search for hotel information and book hotels as long as they are connected with cellular networks or WiFi.

Although smartphone for hotel reservations has been widely adopted in reality, limited studies have explored the attributes that measure mobile usability of hotel reservation. Morosan (2015) found that the perceptions of personalization of hotel guests and their trust to the hotel have strong impacts on their degree to use mobile devices to book hotels. Mobile apps can not only improve the ease of navigation, but also help consumers fulfill their immediate needs and assist them in making time-critical arrangements (Dickinson et al., 2014; Wang et al., 2016b). Hence, app-based hotel m-commerce can be regarded as an ecosystem, which is capable of

delivering an immediate and personalized service and creating value for consumers (Grönroos & Voima, 2013; Morosan & DeFranco, 2015). Table 6 summarized the measurements of mobile usability of hotel reservation based on previous studies.

Table 6. Measurements of mobile usability of hotel reservation

Mobile usability of hotel reservation	**Measurements**	**References**
Design	Appropriate layout	Au Yeung and Law (2004); Höpken et al. (2010); and Dickinson et al. (2014)
	Navigation	Baloglu and Pekcan (2006); and Dickinson et al. (2014)
	Personalization	Morosan (2015)
	User-friendly interfaces	Au Yeung and Law (2004)
Efficiency	Adaptive system	Dickinson et al. (2014); and Höpken et al. (2010)
	Modern operating system	Dickinson et al. (2014)
Speed	Download speed	Baloglu and Pekcan (2006); and Google (2013)

Based on the adjustments of the previous literature, five attributes are included in the present study to measure mobile usability of hotel reservation. That is, appropriate layout (Au Yeung & Law, 2004), navigation (Baloglu & Pekcan, 2006), personalization (Morosan, 2015), user-friendly interfaces (Au Yeung & Law, 2004; Dickinson et al., 2014), and download speed (Baloglu & Pekcan, 2006; Google, 2013). Although adaptability is considered as an attribute to measure efficiency (Dickinson et al., 2014; Gretzel, 2011; Höpken et al., 2010), adaptability is no longer a problem when consumers making hotel reservations via smartphones, as well as modern operating system. Thus, these two attributes are not included.

2.4.3 Usability toward mobile payment

Mobile payment, a revolution of online payment, deals with monetary value transfer and further enhances the transaction efficiency between suppliers and consumers (Schierz, Schilke, & Wirtz, 2010). Several main mobile payment methods exist in the market of China: China UnionPay, Alipay, WeChat Pay, and Apple Pay. According to China Internet Watch Team (2015), in the third quarter of 2015, Alipay and WeChat Pay combined accounted for 89.1% of third-party mobile payment market in China, in which Alipay (69.9%) had an overwhelming strength to lead the market according to iResearch. In the four quarter of 2016, Alipay occupied 54% of mobile payment market share while WeChat Pay occupied 37% of the market share in China (Wang, 2017). The statistics indicate that Alipay and WeChat Pay are two strong competitors in the mobile payment market of China. The main mobile payment methods in China are introduced in the following paragraphs.

China UnionPay

China UnionPay was established in 2002. It is the only domestic bank card organization approved by the State Council and the People's Bank of China, which has the dominant position in China (China UnionPay, 2016b). It plays a vital role of China's bankcard industry in facilitating the industry development. The banking systems allow the inter-bank, cross-region and cross-border usages of bankcards, which are achieved by inter-bank transaction settlement systems, China UnionPay cooperates with other relevant parties such as commercial banks and professional institutions to respond to the rapid economic and social development of China. China UnionPay also constructs an internationally accepted network to meet the demand of using Chinese bankcard overseas and to extend the service scope. Recently, China UnionPay and China Telecom just made an agreement cooperation, which aims at conducting a comprehensive

cooperation in the areas of both financial payment and communication services (China UnionPay, 2016a). As a result, an innovative payment method (i.e. mobile payment) was launched by China UnionPay and the related parties. That is, mobile payment adopts the financial smart card such as subscriber identity module (SIM) card as the payment account carrier, while smartphone phone is the terminal for payment information processing. The integration of bankcard into smartphone phone makes mobile payment achieve on-site payment as well as distant payment.

Alipay

Alipay is a third-party online payment platform lunched in China in 2004 (Alipay, 2016). It is a powerful payment platform that not only cooperates with China UnionPay, but also cooperates with other 65 institutions such as Visa and MasterCard to provide direct payment services to more than 460,000 businesses in China and 300 worldwide merchants (Alipay, 2016). Furthermore, Alipay transaction supports 12 foreign currency transactions and does not charge any transaction fee. In 2008, Alipay first lunched its mobile payment service, which provides more convenience for customers to conduct e-commerce transactions (Lu et al., 2011). The introduction of Quick Response Code (QR code) allows the operator (e.g. attraction) to post information about specific items (e.g. exhibition in certain locations), and assists tourists in accessing the information via smartphones by scanning the QR code or completing the transaction (Dickinson et al., 2014). The finding also indicated that, QR code can enrich the tourist experience in a certain destination to a large extent. At present, QR code payment has been widely applied to mobile payment. Two main services provided by Alipay are local payment and cross-border payment, for both website payment and mobile payment. Furthermore,

Alipay ePass is a solution that combines payment, marketing, and logistics (Figure 6) (Springboard into China, 2016).

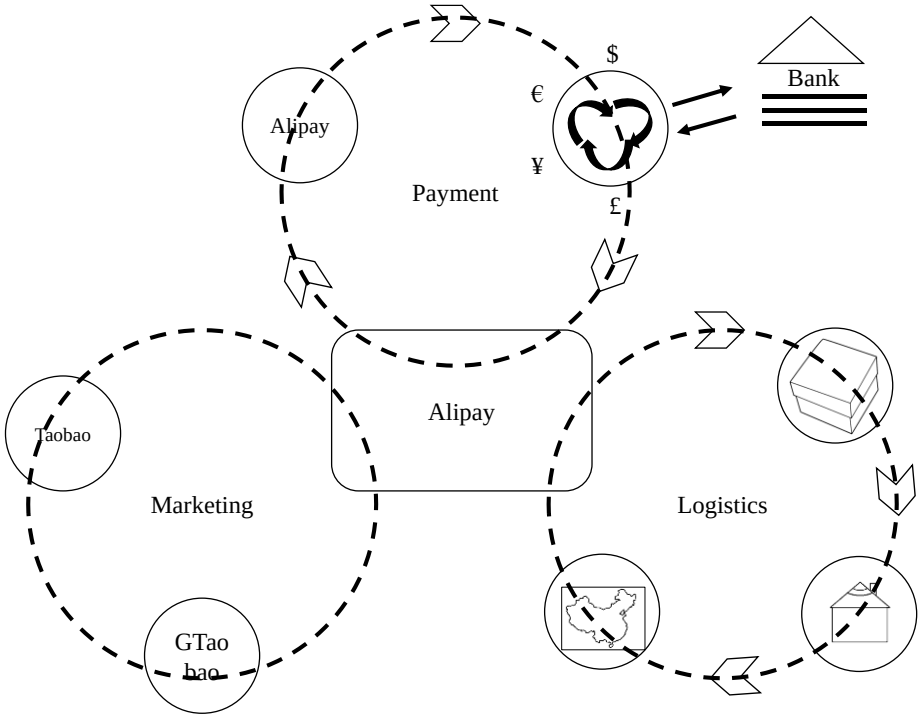


Figure 6. Alipay ePass

Source: Springboard into China (2016)

WeChat Pay

Unlike Alipay, WeChat is originally a communication service software package operated by Tencent in China first released in 2011. It is mainly used for mobile text message and voice message. WeChat Pay service, also known as Tenpay, was added to WeChat in March, 2014 (Dickinson et al., 2014; Techinasia, 2014). Similar to Alipay, it supports both local payment and cross-border payment. Finance Magnates (2014) showed that along with the recent update of mobile operation system such as iOS system, payments and monetary transfer have been streamlined. In other words, users can make quick mobile payment without inputting password through their balance or bundled bank accounts. Nevertheless, starting from March 1, 2016,

WeChat charged users 0.1 percent transaction fee if customers would like to transfer money from their digital wallet (i.e. built-in apps) to their personal bank accounts (Chen, 2016).

Apple Pay

Different from Alipay and WeChat Pay, Apple Pay, the proximity payment method, was first released in China on February 18, 2016 to compete with Alipay and WeChat Pay in Chinese mobile payment market (Carsten, 2016). Apple Pay also cooperates with China UnionPay. For the first 72 hours that Apple Pay was launched in China in February, 2016, 3 million cards were added to Apple Pay, which was three times bigger than the number of cards added to Apple Pay during the initial launch in the United States in 2014 (Appleinsider, 2016; Del Rey, 2016). Compared with Alipay and WeChat Pay, the disadvantages of Apple Pay are in most times, it has to use the Near Field Communication (NFC) method of contactless communication instead of the electronic payments such as the application of QR code in Alipay and WeChat Pay; and it is limited to retail point-of-sale (BBC News, 2016). Following the launch of Apple Pay, Huawei technologies also cooperated with China UnionPay to provide NFC mobile payment service, which aggravates the already fierce competition of mobile payment market in China (Payments, 2016). Samsung Pay is similar to Apple Pay, and Huawei Pay in terms of its mobile payment function. The unique characteristic of Samsung Pay is no matter whether the home screen is locked or not, consumers can pay with their fingerprints (Samsung Newsroom, 2016).

A comparison of different mobile payment methods

In terms of multiple payment methods (i.e. quick pay, QR code payment, in-app payment, and in-app Web-based payment), Alipay and WeChat Pay are similar (Alipay, 2016; Dickinson et al., 2014; WeChat Pay, 2016) (Figure 7).

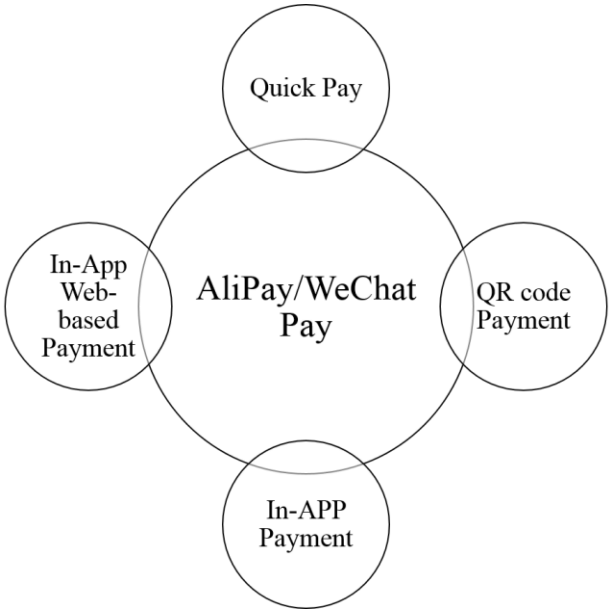


Figure 7. Four payment methods of Alipay/WeChat Pay

Table 7 compares the aforementioned four payment methods. Quick pay and in-app payment are operated by vendors. For quick pay, before making mobile payment, consumers have to verify personal information. After the verification, the vendor scan the payment code shown by consumer, and the transaction can be completed (WeChat Pay, 2016). In reference to in-app payment, some merchants set WeChat Pay as the default mobile payment method for consumers by integrating WeChat Pay Javascript SDK into their apps whereas others set Alipay as the default mobile payment method. Consumers can use QR code mobile payment method if vendors create QR code to provide product information or payment information. In reference to in-app Web-based payment, when users make transactions, vendors will provide transaction information, and most common way is that the page will be jumped to Alipay or WeChat Pay according to the choices of users to complete the transactions. Lu et al. (2011) described the dominant third-party mobile payment service markets (i.e. 90.2% of the market share) in China. Alipay and Tenpay are non-independent third-party payment service whereas Chinapay and 99Biil are independent third-party mobile payment services. Table 8 shows the non-independent

third-party mobile payment services (77.5% of the market share) that dominate the mobile payment market in China.

Table 7. Multiple mobile payment methods

Multiple payment methods	**Vendors**	**Customers**
Quick pay	√	
QR code payment		√
In-app Web-based payment		√
In-app payment	√	

Table 8. Third-party mobile payment service

Third-party mobile payment service	**Type**	**Service domain**	**Market share**
Alipay	Non-independent	C2C; B2C; B2B	56.0%
Tenpay	Non-independent	C2C; B2C; B2B	21.5%
Chinapay	Independent	B2B; B2C	7.8%
99Bill	Independent	B2B; B2C	4.9%

Note:

C2C = customer to customer; B2C = business to customer; B2B = business to business

Source: Lu et al. (2011)

Indeed, the emergence of different types of mobile payments has greatly changed the payment behavior of consumers. The advantages of mobile payment are easy and convenient for both local and cross-border transactions. For example, Vermillion (2010) found that iPad point of sale (POS) system can assist customers in taking orders; and then the orders can be sent to the kitchen immediately. The system allows customers to make digital payments via PayPal and Google Checkout; and can receive the payments from customers as well. Nevertheless, safety and security issue is regarded as a concern for customers if the transaction is related to money,

particularly when the amount is large. To solve this concern, Samsung Pay illustrates that it has three layers of protection: “fingerprint authentication”, “tokenization”, and “KNOX”. Fingerprint authentication is simple and easy to understand whereas tokenization means the replacement of sensitive data element with non-sensitive equivalent. KNOX, also known as KNOX active protection (KAP), is a developed defense-grade security built-in platform. Hotel reservation has had a dramatic change over the past decade driven by the mobile revolution. Different ways of hotel reservations among consumers have gained increasing attention from academic researchers. The finding of the study of Hospitalitynet (2016) showed that customers only use mobile devices for hotel information search but still use the laptop to complete the booking procedure, which implies that the interface development of app, such as incorporating the emerging payment method (e.g. Alipay) to facilitate mobile conversions should be considered to achieve seamless mobile payment (Hospitalitynet, 2016).

Measurements of usability toward mobile payment

Researchers started to investigate the new topic mobile payment in hospitality to cope with the recent trend of the wide adoption of mobile payment (Anuar et al., 2014). Most of the previous studies examined the factors that affect customer satisfaction within the context of website use. For example, Szymanski and Hise (2000) developed a conceptual website model to measure customer satisfaction. The finding indicated that convenience and site design are two prevailing factors to assess online consumer satisfaction. Schierz et al. (2010) investigated the factors that determine the acceptance of mobile payment service. The finding showed that consumers regard compatibility, individual mobility, and subjective norms as important factors to use mobile payment. Recently, by assessing hotel-related smartphone apps, result of Wang, Li, Li, and Zhang (2016c) indicated that ease of use and visual appeal are positively related to

customer satisfaction. Nevertheless, limited studies investigated the use of mobile payment despite the high market penetration and the benefits brought by mobile payment service. For instance, the finding of Falk, Kunz, Schepers, and Mrozek (2016) indicated that in-store mobile payment significantly increases consumers' willingness to pay compared with cash payment.

In conclusion, the biggest advantage of mobile payment is its ubiquity, which means that users can conduct mobile payment anywhere at any time. For the measurements of usability toward mobile payment, it is reflected in several aspects such as compatibility, security, and privacy (Chen & Lin, 2018; Google, 2013). Website security mainly refers to the protection of the privacy of customers such as personal information when they purchase products/services online. It is regarded as a critical factor to achieve the success of a website since this screen-to-face interaction between companies and customers involves personal information disclosure and financial transactions, which are risky for consumers (Chen & Lin, 2018; Park & Gretzel, 2007). Previous researches have indicated that security statements of the website can improve consumers' belief of the trustworthiness of an organization (Park & Gretzel, 2007; Schlosser, White, & Lloyd, 2006). Ranganathan and Ganapathy (2002) also unearthed that security and privacy significantly affect the purchase intention of consumers. At present, it is very common to disclose personal information such as the name, address, and phone number of the user. Moreover, the information of the preference of consumers such as the frequency of purchase and product choices are sometimes recorded by the merchants. Hence, in general, information disclosure is innately connected with information privacy, and it is a potential threat for consumers who are afraid of the control of third-party over information or information use by others (Mothersbaugh, Foxx, Beatty, & Wang, 2011; Phelps, Nowak, & Ferrell, 2000). Morosan (2015) summarized that the major contemporary privacy challenges are the use of massive credit

cards, the disclosure of private information, and the security concern of mobile payment systems. Through collecting data from hotel guests who come from the United States, Morosan and DeFranco (2015) unearthed that trust in the app significantly affects the personal information disclosure via apps. Based on previous literature, Table 9 summarizes the measurements of usability toward mobile payment.

Table 9. Measurements of usability toward mobile payment

Usability toward mobile payment	**Measurements**	**References**
Accessibility/Mobility	Conduct mobile payment anywhere	Schierz et al. (2010); and Zhou (2013)
	Conduct mobile payment at any time	Zhou (2013)
Compatibility	Adopted by different operation systems	Google (2013)
Notification	Instant payment notification	Paypal (2016)
Security	Safety	Chen and Lin (2018); Ha et al. (2012); Morosan and DeFranco (2015); Park and Gretzel (2007); Ranganathan and Ganapathy (2002); and Schlosser et al. (2006)
Speed	Download speed	Google (2013)
Simplicity	Convenient	Lee, Moon, Kim, and Mun (2015)

2.5 Theory of planned behavior (TPB)

Previous studies adopted different website evaluation models for hotel website evaluation, mainly considering functionality and usability (Bai et al., 2008; Leung et al., 2013; Salavati & Hashim, 2015). Regarding the topic mobile payment, most of the previous studies adopted technology acceptance model (Liébana-Cabanillas, Muñoz-Leiva, & Sánchez-

Fernández, 2017; Schierz et al., 2010). Since mobile payment has been widely accepted within the context of China, hence technology acceptance model, which deals with the acceptance of a certain type of technology, is not considered. In terms of the topic mobile payment for hotel reservations, if the present study only adopts website evaluation model as what most previous studies did, the detailed aspects of functionality and usability are not clear. Thus, the present study integrates website evaluation model into theory of planned behavior (Ajzen, 1991) (Figure 8), a fundamental theory to explain consumer behavior to comprehensively understand the detailed aspects of mobile functionality and usability.

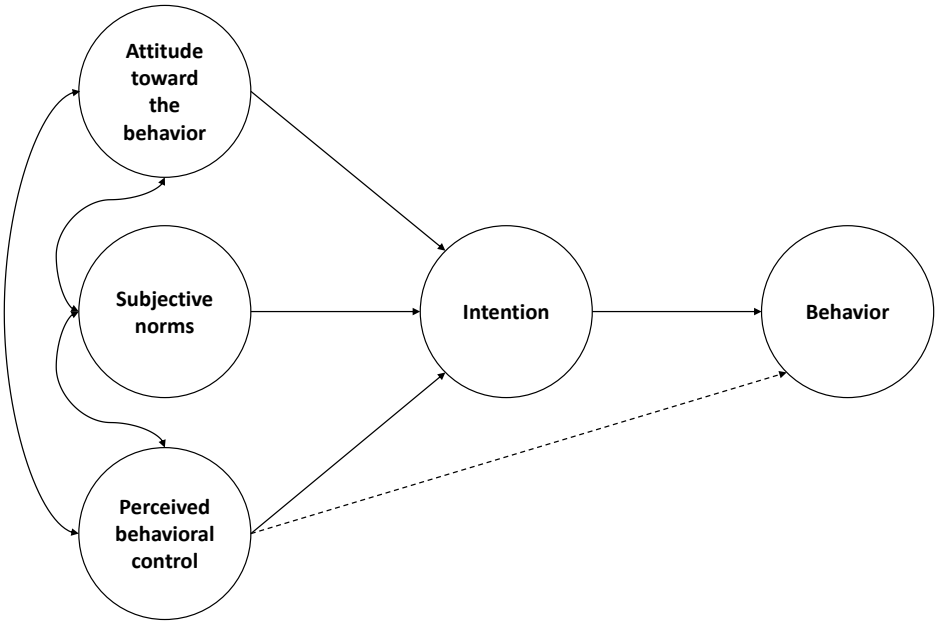


Figure 8. Theory of planned behavior

Theory of planned behavior was first advocated in psychology (Ajzen, 1991), and it is an extension of theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The limitation of theory of reasoned action is that people have incomplete volitional control. Indeed, predicting human behavior is a difficult task because of its complexity, but TPB is well supported by empirical evidence to predict user intentions (Conner & Armitage, 1998; Lu, Zhou,

& Wang, 2009; Mathieson, 1991; Pavlou & Fygenson, 2006). In theory of planned behavior, the three most important influencing factors are attitude toward the behavior, subjective norms, and perceived behavioral control. Attitude toward the behavior refers to either favorable or unfavorable attitude toward a particular behavior. Subjective norms denote the degree of the impact from the social network of a person. Perceived behavioral control indicates the perception of ease or difficulty to control a particular behavior. Intentions, together with perceived behavioral control, account for considerable variance in consumers' buying behavior, as with the general rule suggests that the stronger an intention to engage in a certain behavior, the more likely a person will perform that behavior, although the availability of other resources such as time, money, and cooperation with others may also affect the intention of a person (Ajzen, 1985). In conclusion, if a person intends to perform the behavior, people in his/her social networks support his/her decision, and the person himself/herself is confident in performing such a behavior, in this case, there is a high probability for this person to perform a certain behavior.

In early 1990s, through comparing technology acceptance model and theory of planned behavior to predict the intention of users to use information systems, result indicated that theory of planned behavior can provide more specific information for the development of better guide (Mathieson, 1991). Later, Conner and Armitage (1998) extended TPB by adding additional six variables, such as past experience and self-identity. In mid-2000s, Pavlou and Fygenson (2006) extended TPB into the context of e-commerce to predict e-commerce adoption of consumers, and the finding revealed the importance of integrating trust and technology adoption variables into TPB framework. In late 2000s, by mainly based on TPB, Lu et al. (2009) examined the factors that affect the use of instant messaging among Chinese and the finding indicated that subjective norms and perceived behavioral control significantly affect the intention of Chinese toward the

use of instant messaging. In the recent five years, researchers have started to extend TPB by integrating TPB into other theories to comprehensively understand the intention of consumers. For example, Han (2015) integrated TPB into value-belief-norm theory to predict the pro-environmental intention for a green loading and the result proved that attitudes and perceived behavioral control play more important roles when the alternatives for consumers are less attractive.

Over the last three decades, theory of planned behavior has been widely applied in psychology and marketing disciplines. In the recent years, it has been applied into e-commerce as well. Meanwhile, it is gaining increasing attention among academic researchers in tourism. For example, Kaplan, Manca, Nielsen, and Prato (2015) applied TPB to analyze the intentions of tourists of bike-sharing for cycling holiday. The results indicated the great interest of tourists in bike-sharing. Moreover, past cycling experience and the culture of cycling-friendly country also affect the choices of tourists. Different from the study of Han et al. (2010) and Kaplan et al. (2015), Sparks and Pan (2009) added the use of information sources to the original TPB model to investigate the consumer behavior of searching for travel–related information, to examine the values of potential Chinese outbound tourists regarding destination attributes, and to evaluate their attitudes toward international travel. The findings showed that television program is the most important information source that motivates Chinese tourists to travel abroad, and the top three most important destination attributes are natural beauty of a destination, infrastructure quality in the destination, and the autonomy of a destination. Limited attention was paid in hospitality. For example, Han et al. (2010) applied TPB to investigate the intention of consumers to choose green hotels to stay overnight. The results showed that attitude, subjective norms, and perceived behavioral control positively affect the intention of tourists to stay in green hotels.

Recently, smartphone users have exceeded PC users in online hotel booking, and the trend is continuing (Commeasure, 2014). Moreover, there is a high penetration rate of mobile hotel reservations via mobile payment in China (Phocuswright, 2017; Wang, 2017). Since theory of planned behavior is the most fundamental, popular, and influential framework in studying human actions (Ajzen, 2001), thus it is adopted in the present study to examine the mobile payment behavior for hotel reservations. To cope with the recent trend and to test whether TPB can be applied to mobile payment context, the present study investigates the impacts of functionality and usability toward mobile payment on the repurchase intention of hotels by integrating website evaluation model into theory of planned behavior, and considering the three most important components involved in theory of planned behavior, that is, attitude toward the behavior, subjective norms, and perceived behavioral control.

2.5.1 Attitude toward mobile payment for hotel reservation

Mobile payment is an emerging topic, but limited studies have investigated this topic. Most of the previous literature examined the attitude toward using websites or smartphones. For example, Ladhari (2010) found that high quality information determines the positive attitude of a consumer toward the use of a website. The study of Tussyadiah and Wang (2014) further explored the attitude. Through investigating a total of 275 students who study in a university of Hong Kong SAR, China, three patterns are identified. The results revealed that once the travelers receive a push recommendation from their smartphones, they might have three actions. The first one is following the recommendation (i.e. 67.4%). That is, travelers show a favorable attitude to the recommendations. The second one is the opposite (i.e. 7.2%), which is rejecting the recommendation. In other words, travelers indicate an unfavorable attitude to the recommendations. The third one is holding the decision (i.e. 17.4%). In this case, travelers do not

make immediate decisions, showing that they may use the recommendation as a reference for future decisions. The study of Tussyadiah and Wang (2014) also proved that the recommendation of the smartphone may not warrant the immediate decision of travelers. Okazaki et al. (2014) summarized that convenience and information access are regarded as the perceived benefits of mobile technology, and customers show a positive attitude toward adopting mobile technology. Mobile payment, as a commonly adopted mobile technology in China, it is proposed that functionality toward mobile payment is positively related to attitude.

On the other hand, Ladhari (2010) found that website design and navigation positively affect the attitude of a consumer toward a website. The findings of Wang et al. (2016a) indicated that the attitude of the majority of participants is positive toward smartphone recommendations. In addition, confidence and trust are mainly based on the perceived proactiveness, autonomy, and social ability of users. That is, if users can perceive the ability of their smartphones in processing information and knowledge, use it without intervention, and communicate with others without any difficulty and risks, then they can trust the device, and adopt the recommendations of smartphones. Recently, Fan, Shao, Li, and Huang (2018) conducted a comparison study between Chinese and US citizens of the attitude toward mobile payment use. Result indicated that the impacts of payment culture and perceived security in China are significantly larger than that in USA. Since mobile payment, a revolution of mobile technology, shares the similar characteristics such as mobile mobility and convenience with mobile technology (Schierz et al., 2010), thus, the positive relationship between usability toward mobile payment and attitude is proposed.

In terms of the measurements of the attitude toward mobile payment, Anand and Sternthal (1990) measured the attitude in four aspects, that is, from bad to good, from foolish and fun, from unenjoyable to enjoyable, and from unpleasant to pleasant. In recent years, Liébana-

Cabanillas et al. (2017) still adopted the measurements of attitude from the study of Anand and Sternthal (1990) and applied the measurements in studying the consumer behavior of using mobile payment systems. The measurements range from dislike to like, from absurd to intelligent, from boring to interesting, and from unpleasant to pleasant. Hence, based on the previous and the recent studies (Anand & Sternthal, 1990; Liébana-Cabanillas et al., 2017), the present study also uses the measurements of attitude from four aspects to measure attitude toward mobile payment. That is, mobile payment for hotel reservation is good, mobile payment for hotel reservation is fun, mobile payment for hotel reservation is enjoyable, and mobile payment for hotel reservation is pleasant.

2.5.2 Subjective norms toward mobile payment for hotel reservation

Since people live in a society, hence apart from the attitude toward the behavior, the behavior is also affected by the perception of social references of an individual. In other words, it is the relevant believe of others whether he or she should or should not perform such a behavior (Hsu & Huang, 2012). Hence, any person and any groups in people's social network may serve as a reference group or reference groups which influence the beliefs, attitudes, and choices of individuals, and this phenomenon is known as subjective norms (Moutinho, 1987).

Some studies discuss about the subjective norms toward mobile phone use. For example, the finding of Schepers and Wetzels (2007) showed that subjective norms positively affect the intention of consumers to use smartphones. It is also found that this relationship is more likely to be found within western society context, rather than non-western society context. Even it is quite common for people to turn to some groups for their standards or judgments toward a particular behavior, limited studies have addressed the impact of subjective norms on mobile payment. For example, results of Wang et al. (2016a) showed that when consumers intend to search for travel

information sources, they will use social networking platforms to communicate with their friends and families via their smartphones. The findings also indicated that the instant feedbacks about information sources positively affect the decision-making of consumers. In addition, in terms of the impact of mobile usability on subjective norms, Mauri and Minazzi (2013) unearthed that when consumers search for hotel information in online travel agencies, they will read the reviews posted by hotel guests, and the reviews significantly affect the decision-making of other consumers. As a revolution of mobile technology, it is expected that mobile payment shares the similar characteristics of mobile functionality and usability (de Reuver & Ondrus, 2017).

In reference to the measurements of subjective norms toward mobile payment based on the previous studies (Hsu & Huang, 2012; Yang, Lu, Gupta, Cao, & Zhang, 2012), four adjusted questions indicated below are considered suitable to measure subjective norms within the context of mobile payment for hotel reservations:

- → Most people in my social network use mobile payment for hotel reservation.
- → Most people in my social network wish me to use mobile payment for hotel reservation.
- → Most people in my social network would support me to use mobile payment for hotel reservation.
- → If people in my social network use mobile payment for hotel reservation, I will use.

2.5.3 Perceived behavioral control toward mobile payment for hotel reservation

Given the attitude toward a certain behavior and the reference group of others within the society, perceived behavioral control is also considered as a very important aspect for consumers. Perceived behavioral control refers to the potential constraints of an intended action, such as the available resources (Liska, 1984) and the opportunity (Thoms Sarver, 1983). In other words, perceived behavioral control refers to the ability of an individual to control a given behavior

(Hsu & Huang, 2012). Limited literature examined the perceived behavioral control toward mobile payment. For example, Oliveira et al. (2016) pointed out that the information related to compatibility and perceived technology security has significant direct impact on perceived behavioral control of users. Szymanski and Hise (2000) also proved that financial security is a major concern when customers make hotel purchases online. Recently, Lee et al. (2015) unearthed that when consumers are involved in the interaction process (e.g. performing requested activities), the perceived ability to control the risks positively affects the confidence of a user. Regarding the measurements of perceived behavioral control, Ajzen (2002) categorized it in two aspects: self-efficacy and controllability. Thus, within the context of mobile payment for hotel reservations, the two questions measuring perceived behavioral control are indicated below:

→ Self-efficacy: I am confident in using mobile payment for hotel reservation.

→ Controllability: Mobile payment for hotel reservation is not beyond my control.

2.6 Customer satisfaction

Customer satisfaction is regarded as a basic parameter, which is commonly used to evaluate the performance of tourism products and services. For the previous studies which adopted website evaluation model to evaluate hotel or tourism websites, customer satisfaction is always considered as an important dimension to measure the performance of hotel or tourism websites (Bai et al., 2008; Harison & Boonstra, 2008; Pereira, de Fátima Salgueiro, & Rita, 2017). Thus, the present study also contemplates to include customer satisfaction in the proposed research framework.

According to Oliver (1981, p. 32), customer satisfaction refers to "the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience." Babin and Griffin (1998,

p. 129) defined customer satisfaction as “a positive affective reaction to the favorable appraisal of a consumption experience.” Although it is not a new concept, numerous studies are intended to find out the factors that influence customer satisfaction so as to improve the services provided by destinations, such as hotels and attractions (Bai et al., 2008; Hao, Yu, Law, & Fong, 2015). It is widely accepted that service quality is a decisive factor to measure customer satisfaction, and it is vital for effective service delivery. Perceived service quality is normally compared with the expectation of customers, and it may or may not exceed the expectation of customers (Parasuraman, Zeithaml, & Berry, 1988). To measure service quality, service quality model (SERVQUAL) was originally advocated by Parasuraman et al. (1988, p. 21). Five dimensions, “tangibles”, “reliability”, “responsiveness”, “assurance”, and “empathy” were taken into consideration. Later, SERVQUAL was modified by Knutson, Stevens, Wullaert, Patton, and Yokoyama (1990), which is known as LODGESERV, a service quality index designed for lodging industry.

Along with the rapid development of ICT, Parasuraman and Grewal (2000) suggested the application of SERVQUAL to examine the perceived quality of customers when they interact with technology rather than service personnel. Zeithaml, Parasuraman, and Malhotra (2002) investigated the main difference between traditional service quality and e-service quality and suggested a e-SERVQUAL model. Result showed that when applying SERVQUAL model to online environment, additional attributes should be taken into consideration, such as flexibility, ease of navigation, and the issue of safety and security. Within the context of online environment, the most dominant service quality model in Web context is e-SERVQUAL model (Zeithaml et al., 2002). The trend of the transformation from the application of service quality model to online environment started from early 2000s. For example, Szymanski and Hise (2000) measured the

online satisfaction of customers by developing a conceptual website model. The finding indicated that convenience and website design are the two most important dominant factors in assessing online consumer satisfaction.

Since 2010s, more studies have started to investigate the service quality in online environment. For example, Ye, Li, Wang, and Law (2014) analyzed 43,726 online reviews among 774 star-rated hotels to examine how price influences the perceived service quality and value of consumers. A positive impact of price on the perceived service quality was found. Nonetheless, limited researchers have investigated the application of service quality model to mobile technology, mobile sites, or smartphones. For example, Kim, Chung, Lee, and Preis (2015) investigated the impacts of enjoyment (i.e. attitude) and value (i.e. subjective norms) on customer satisfaction within mobile shopping context and found they have significant positive impacts on customer satisfaction. Shiau and Luo (2012) also proved that reputation of social exchange significantly affects consumer satisfaction toward online group buying. In the aspect of perceived behavioral control, that is, the belief about the factor that can facilitate or hinder the performance of a behavior, Elbeltagi and Agag (2016) found that privacy and safety are predictors of e-customer satisfaction after investigating the online shopping behavior of consumers.

Within the context of online environment, in general, website functionality and website usability are perceived as important measurements of service quality from the perspective of consumers. Nevertheless, based on the findings of the previous studies it can be inferred that consumers are also affected by their attitudes, their social communities, and their ability to control the behavior. In other words, functionality and usability may not directly affect customer satisfaction. Attitude, subjective norms, and perceived behavioral control, three most important

elements in theory of planned behavior may mediate the relationships between functionality and customer satisfaction, and between usability and customer satisfaction. Referring to the measurements of customer satisfaction, two questions are used as the measurements of customer satisfaction within the context of mobile payment for hotel reservations (Bai et al., 2008).

→ I am satisfied with mobile payment experience for my most recent hotel reservation.

→ My choice of using mobile payment to make my recent hotel reservation is a wise one.

2.7 Repurchase intention

Repurchase intention indicates the probability that a consumer may continue to buy the product or service through the same channel, and it is regarded as an important element in theory of planned behavior (Yang, Lu, Chau, & Gupta, 2017). Some previous studies have investigated the relationships between elements involved in theory of planned behavior (i.e. attitude, subjective norms, and perceived behavioral control) and the repurchase intention of consumers (Bhatiasevi & Yoopetch, 2015; Lam & Hsu, 2004, 2006). For example, Lam and Hsu (2004) conducted two empirical studies in 2004 and 2006 respectively to predict the destination choices of Mainland Chinese tourists and Taiwanese tourists. The findings showed that attitude and perceived behavioral control are tightly related to the intention of Mainland Chinese tourists visiting Hong Kong. On the contrary, subjective norms and perceived behavioral control have significant impacts on the behavioral intention of Taiwanese tourists for their destination selection. In addition, the findings of Bhatiasevi and Yoopetch (2015) indicated that that social norms are positively affect the intention of consumers to use e-booking. Moreover, subjective norms are related to the reuse intention of consumers. Kim, Kim, and Shin (2009a) indicated that subjective norms are the precursor of perceived usefulness, attitude, and the intention of customers to reuse airline websites. The finding implies that customers tend to trust on referents

who are frequent customers of certain airline companies. Okumus, Bilgihan, and Ozturk (2015) also proved that social norms play significant roles for consumers to use smartphone apps through investigating the factors that affect the intention of consumers to use smartphone diet apps to order food and beverages at foodservice businesses. Furthermore, Sparks and Pan (2009) investigated the behavioral intention of tourists about destination selection. The finding indicated that subjective norms and perceived behavioral control are related to the behavioral intention of Mainland Chinese in choosing Australia as a tourist destination. In terms of mobile payment, Zhou (2013) identified the factors that affect the intention of consumers to adopt mobile payment service. The finding indicated that trust, mobile payment flow, and customer satisfaction determine the continuous intention of consumers to use mobile payment. Gao, Yang, Guo, and Jing (2018) investigated the continuous intention of using QR code for mobile payment in China and found that performance expectancy, effort expectancy, and social influences of using mobile payment significantly influence the intention of consumers to use mobile payment service. The above evidence indicates the impacts of attitude, subjective norms, and perceived behavioral control on the repurchase intention of consumers.

Numerous studies have proved that if customers are satisfied, they will have repurchase intention (Ladhari & Michaud, 2015; Liu et al., 2000). For hotel reservations, customer satisfaction is an antecedent of repurchase intention, and it significantly affects the repurchase intention of hotels (Chang & Chang, 2010; Kim, Kim, & Kim, 2009b). For example, faced with the increasing popularity of online shopping, Bai et al. (2008) developed a conceptual model to test the impact of website quality (i.e. functionality, usability) on customer satisfaction and purchase intention. Results showed that website quality directly and positively affects customer satisfaction; and customer satisfaction also directly and positively affects purchase intention.

Ladhari and Michaud (2015) examined the influence of comments written by Facebook friends on the intentions of booking a hotel by designing an experiment. After a survey of 800 university students, the finding showed that comments generated on Facebook influenced the decision-making process of users. The finding is similar to that of the studies of Mauri and Minazzi (2013) as well as Ye, Law, Gu, and Chen (2011) that favorable reviews concerning a hotel increase the likelihood of booking intention of consumers. By conducting a questionnaire survey in a world heritage site in China, the finding of Su et al. (2016) proved that customer satisfaction fully mediates the relationship between service quality and the revisit intention of tourists.

Although the positive relationship between customer satisfaction and the repurchase intention of consumers has been provided by previous studies in hospitality (Kim et al., 2009b), limited studies have considered the impact of customer satisfaction on the repurchase intention in the context of mobile payment for hotel reservations. Thus, the present study tests whether the customer satisfaction directly and positively affects the repurchase intention within the context of mobile payment for hotel reservations, or whether the mediating effect of customer satisfaction exists. Based on the study of Bai et al. (2008), the following two questions are used in the present study to measure hotel repurchase intention via mobile payment.

→ I will make hotel reservations using mobile payment through the mobile websites of OTAs in the next 12 months.

→ I will make hotel reservations using mobile payment through the APP of OTAs in the next 12 months.

2.8 Relevant research gaps identified

Transformation from website to mobile website

Chronologically, from early 2000s to 2010s, hotel websites have been developing rapidly. When evaluating hotel websites, website functionality and website usability have gained extensive attention from previous studies (Bai et al., 2008; Bastida & Huan, 2014). Since 2015, the rapid development of mobile technology has led to the trend of the transformation from hotel websites to mobile hotel websites. Nevertheless, limited studies have investigated functionality and usability of mobile hotel websites and mobile hotel apps. Thus, the present study assesses the quality of hotel reservation by smartphones.

Mobile payment as an evolution of mobile technology

Meanwhile, along with the transformation from the use of hotel websites to mobile hotel websites, mobile payment has been widely adopted as an evolution of mobile technology (Liébana-Cabanillas et al., 2017). The wide acceptance of mobile payment is reflected in the high penetration rate of mobile payment use in China and the increasing number of users in using mobile payment for mobile hotel reservations (Chen & Li, 2017; Morosan & DeFranco, 2016). Nonetheless, limited studies have investigated the functionality and usability of mobile payment for hotel reservations. In addition, although the relationship between customer satisfaction and repurchase intention has been investigated extensively by previous studies (Ladhari & Michaud, 2015; Liu et al., 2000), the applicability in the context of mobile payment for hotel reservations is not clear. Thus, the present study also investigates the impacts of mobile functionality and usability toward mobile payment on hotel repurchase intention.

Website evaluation model's integration into theory of planned behavior

In terms of hotel website evaluation, most of the previous studies adopted the conceptual model of website evaluation to evaluate hotel websites. Nonetheless, if the present study only adopts the conceptual model of website evaluation, the detailed aspects of functionality and usability cannot be fully explored. Hence, in order to catch up with the recent trend of using mobile payment for hotel reservations, to better satisfy the needs of consumers, and to increase the repurchase intention of customers, the present study proposes a research framework (Figure 13) based on the conceptual of website evaluation developed by Bai et al. (2008) and theory of planned behavior advocated by Ajzen (1991). In summary, the present study investigates the impacts of functionality and usability toward mobile payment on the repurchase intention of hotels by bridging the aforementioned three gaps.

2.9 Chapter summary

This chapter first introduces the development of hotel websites and different models for website evaluation, with website functionality and website usability as two main dimensions. Gradually, the increasing number of smartphone users shows the transition from websites to mobile websites within the context of hotel reservations. Thus, mobile functionality and mobile usability are taken into consideration. Mobile functionality is further divided into mobile functionality of hotel reservation, and functionality toward mobile payment. Similarly, mobile usability is also further categorized into mobile usability of hotel reservation, and usability toward mobile payment. The measurements of each dimension are listed, and the gaps are identified.

Chapter 3. Conceptual model development

3.1 Chapter introduction

Chapter 3 proposes 15 hypotheses within mobile payment context based on the previous studies and introduces the conceptual model development based on website evaluation model and theory of planner behavior. Meanwhile, measurements of each dimension involved in the proposed framework are advocated.

3.2 Hypothesis development

The direct impacts of website functionality and website usability on customer satisfaction have been proved by previous studies (Bai et al., 2008; Park et al., 2007). For example, the findings of Liu et al. (2000) and Kim and Lim (2001) revealed that system quality and information quality play vital roles in determining customer satisfaction in online purchase. Park et al. (2007) evaluated the quality of hotel reservation via smartphones and the finding showed that information richness positively affects customer satisfaction. The finding of Bai et al. (2008) also proved that website quality directly and positively affects customer satisfaction. Within the context of mobile hotel reservations, the finding of Wang and Wang (2010) revealed that the perceived value of mobile hotel reservation is vital to the adoption among customers; and determines their satisfaction level. Since mobile payment, as a revolution of mobile technology, shares the similar functional characteristics with other types of information and communications technologies, hence, hypothesis 1 is proposed within the context of mobile payment for hotel reservations (Figure 9).

H1: *Functionality toward mobile payment is positively related to customer satisfaction.*

Meanwhile, some studies have proved that website usability is positively associated with customer satisfaction (Park & Gretzel, 2007; Schierz et al., 2010; Szymanski & Hise, 2000). For

example, Szymanski and Hise (2000) developed a research framework to measure online customer satisfaction of websites. The finding indicated that convenience and website design are two important factors to assess online consumer satisfaction. Similar findings are identified by the studies of Park et al. (2007) and Schierz et al. (2010). Wang et al. (2016b) also indicated that ease of use and visual appeal are positively related to customer satisfaction. Since mobile payment shares the similar usability characteristics with m-commerce technology, hence, hypothesis H2 is proposed within the context of mobile payment for hotel reservations (Figure 10).

H2: *Usability toward mobile payment is positively related to customer satisfaction.*

Nevertheless, a number of studies have indicated that mobile functionality and mobile usability significantly affect attitude, subjective norms, and perceived behavioral control (Murphy et al., 2016; Okazaki et al., 2014; Oliveira et al., 2016). For example, Ladhari (2010) found that factors such as information quality determines the positive attitude of a consumer toward the use of a website. Okazaki et al. (2014) summarized that convenience and information access are regarded as the perceived benefits of mobile technology, and customers show a positive attitude toward mobile technology adoption. Murphy et al. (2016) revealed that mobile-friendly content offered by OTAs has the potential for their popularity. In other words, the content delivered by OTAs affects the attitudes of other users of hotel booking. Wang et al. (2016a) showed that the information delivered by smartphones positively affects the decision-making of consumers. Oliveira et al. (2016), on the other hand, pointed out that compatibility information and perceived technology security have significant direct impacts on the perceived behavioral control of consumers. That is, consumers will make evaluations on whether to adopt mobile technology based on their ability to control a certain type of technology. Thus,

hypotheses H3a, H3b, and H3c are proposed within the context of mobile payment for hotel reservations (Figure 9).

H3a: *Functionality toward mobile payment is positively related to attitude.*

H3b: *Functionality toward mobile payment is positively related to subjective norms.*

H3c: *Functionality toward mobile payment is positively related to perceived behavioral control.*

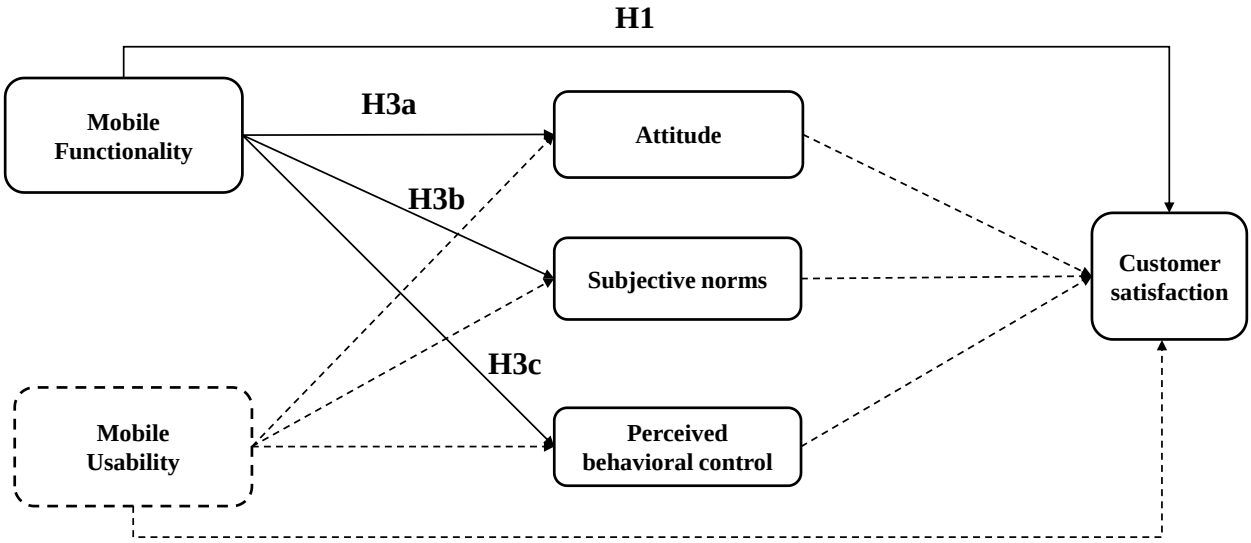


Figure 9. H1, H3a, H3b, and H3c

Similarly, website usability also affects attitude, subjective norms, and perceived behavioral control (Ladhari, 2010; Mauri & Minazzi, 2013). For example, Ladhari (2010) found that website design and navigation positively affect the attitude of a consumer toward the use of a website. Moreover, when using smartphones, the majority of the participants hold a positive attitude toward smartphone recommendations (Wang et al., 2016a). For the impact of mobile usability on subjective norms, the finding of Mauri and Minazzi (2013) showed that when consumers search for hotel information in online travel agencies, the reviews posted by hotel guests significantly affect the decision-making of hotel booking among other consumers.

Nevertheless, according to Szymanski and Hise (2000), financial security is a major concern when customers make hotel purchase decisions online. Regarding perceived behavioral control, Lee et al. (2015) unearthed that when consumers are involved in the interaction process (e.g. performing requested activities), the perceived ability to control the risks positively affects the user's confidence. Thus, hypotheses H4a, H4b, and H4c are proposed within the context of mobile payment for hotel reservations (Figure 10).

H4a: *Usability toward mobile payment is positively related to attitude.*

H4b: *Usability toward mobile payment is positively related to subjective norms.*

H4c: *Usability toward mobile payment is positively related to perceived behavioral control.*

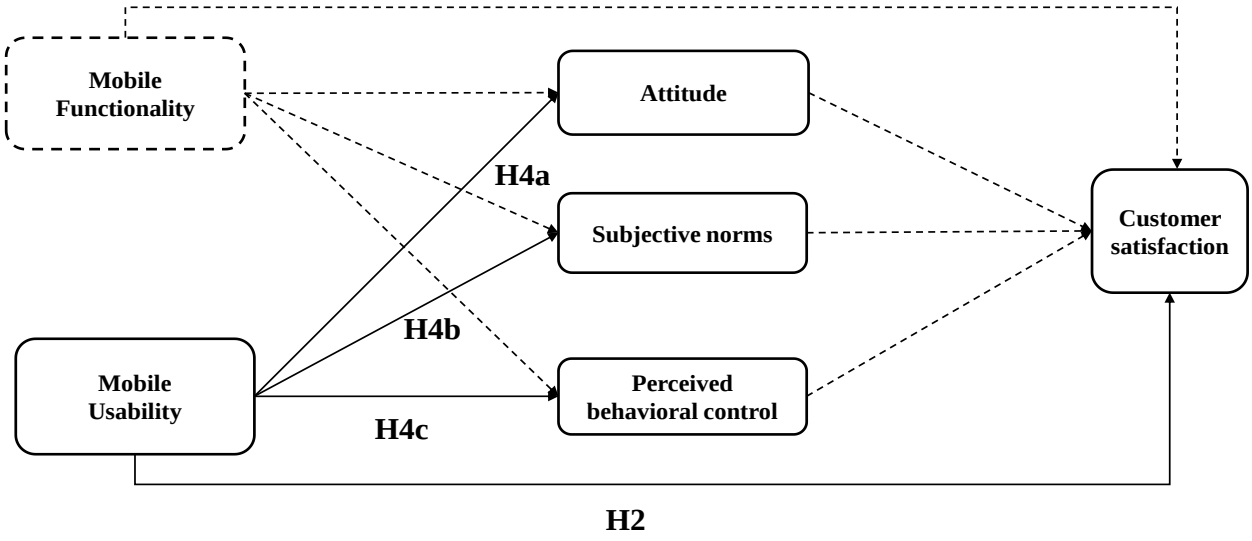


Figure 10. H2, H4a, H4b, and H4c

Previous studies have identified the positive relationships between attitude and customer satisfaction, subjective norms and customer satisfaction, and perceived behavioral control and customer satisfaction (Elbeltagi & Agag, 2016; Kim et al., 2015; Shiau & Luo, 2012). For example, Kim et al. (2015) investigated the impact of enjoyment (i.e. attitude) and value (i.e.

subjective norms) on customer satisfaction within mobile shopping context and found that they have significant positive impacts on customer satisfaction. Moreover, Shiau and Luo (2012) unearthed that reputation of social exchange significantly affects consumer satisfaction toward online group buying. Perceived behavioral control is the belief about the factors that can facilitate the performance of a certain behavior or hinder the performance of a certain behavior. For example, through investigating the online shopping behavior of consumers, Elbeltagi and Agag (2016) found that privacy and safety are strong predictors of e-customer satisfaction. Thus, hypotheses H5a, H5b, and H5c are proposed within the context of mobile payment for hotel reservations (Figure 11).

H5a: *Attitude toward mobile payment is positively connected with customer satisfaction.*

H5b: *Subjective norms toward mobile payment are positively connected with customer satisfaction.*

H5c: *Perceived behavioral control toward mobile payment is positively connected with customer satisfaction.*

Furthermore, the mediating effects of attitude, subjective norms, and perceived behavioral control between mobile functionality and customer satisfaction, and between mobile usability and customer satisfaction can be tested based on the proposed hypotheses H1, H2, H3a, H3b, H3c, H4a, H4b, H4c, H5a, H5b, and H5c.

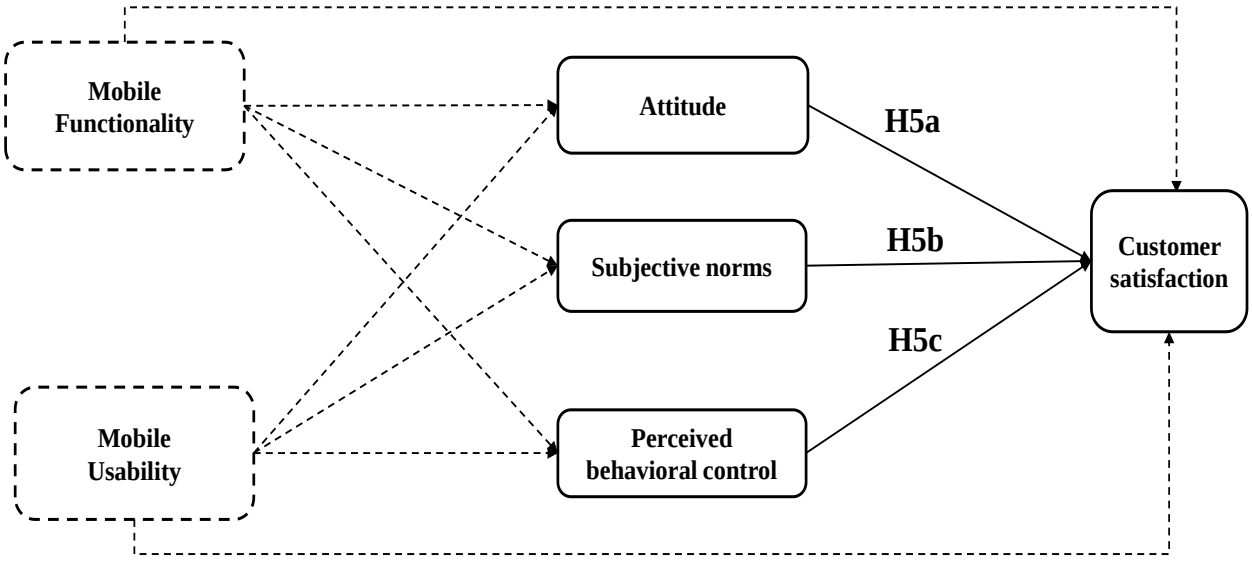


Figure 11. H5a, H5b, and H5c

The relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention have been studied by previous studies (Bhatiasevi & Yoopetch, 2015; Isaid & Faisal, 2015; Mauri & Minazzi, 2013). The finding of Isaid and Faisal (2015) showed that attitude toward mobile phone brand would have a significant influence on the repurchase intention of mobile phones among consumers. Subjective norms have similar significant impacts. For example, Bhatiasevi and Yoopetch (2015) indicated that social norms positively affect the intention of consumers to adopt hotel e-booking. Furthermore, Mauri and Minazzi (2013) and Ye et al. (2011) proved that favorable reviews of a hotel increase the likelihood of hotel booking intention of other consumers. In terms of perceived behavioral control, Wang et al. (2016a) found that if users have the ability to process information, communicate with others, and control the risks, they choose to accept the recommendations sent by smartphones. Furthermore, through investigating the behavioral intention of Mainland Chinese to select Australia as a tourist destination, the finding of study of Sparks and Pan (2009) indicated that both subjective norms and perceived behavioral control positively affect the behavioral intention of tourists. Within mobile payment

context, de Kerviler, Demoulin, and Zidda (2016) found that subjective norms enhance the intention of customers to adopt in-store proximity mobile payment method (pmp), whereas the perceived risks associated with in-store pmp reduce the intention of the usage among consumers. Thus, hypotheses H6a, H6b, and H6c are proposed within the context of mobile payment for hotel reservations (Figure 12).

H6a: *Attitude toward mobile payment is positively related to the repurchase intention of hotels.*

H6b: *Subjective norms toward mobile payment are positively related to the repurchase intention of hotels.*

H6c: *Perceived behavioral control toward mobile payment is positively related to the repurchase intention of hotels.*

Furthermore, the relationship between customer satisfaction and repurchase intention has been proved by numerous previous studies (Blut, Frennea, Mittal, & Mothersbaugh, 2015; Liao, Chen, & Yen, 2007). The study of Bai et al. (2008) about website evaluation unearthed that customer satisfaction directly and positively affects purchase intention. Ladhari and Michaud (2015) and Su et al. (2016) also proved that once the customers are satisfied, they are more likely to have repurchase intention. Thus, hypothesis H7 is proposed within the context of mobile payment for hotel reservations (Figure 12). Based on the proposed hypotheses H5a, H5b, H5c, H6a, H6b, H6c, and H7, the mediating effect of customer satisfaction can be tested.

H7: *Customer satisfaction is positively related to the repurchase intention of hotels.*

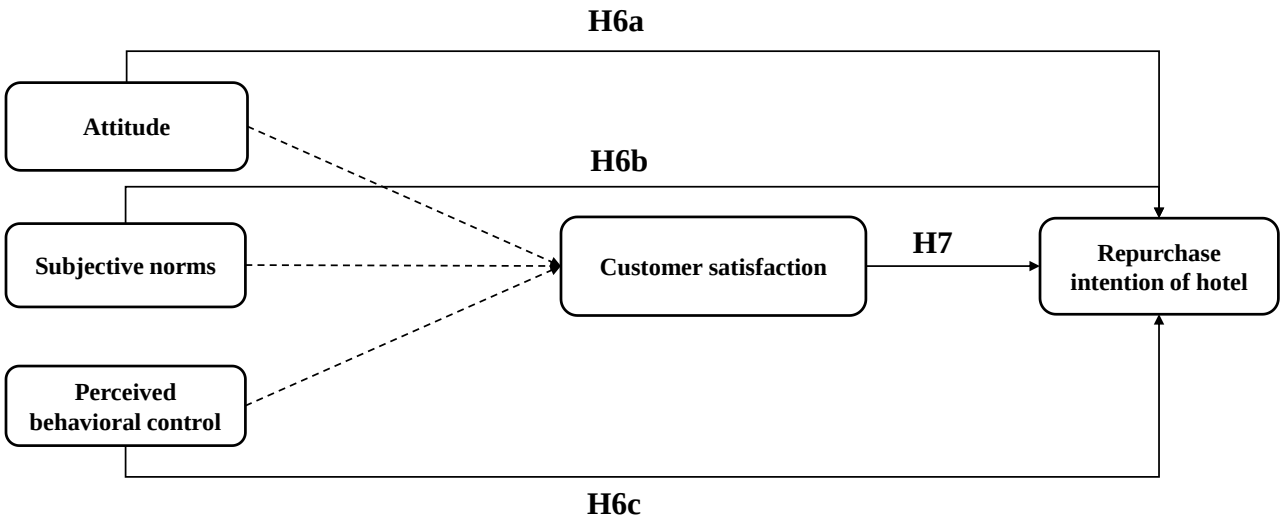


Figure 12. H6a, H6b, H6c, and H7

In summary, considering the increasing number of smartphone users at present and the limited investigation of mobile payment for hotel reservations, the research framework is proposed to investigate the impacts of functionality and usability toward mobile payment on the repurchase intention of hotels based on the conceptual website evaluation model advocated by Bai et al. (2008) and theory of planned behavior advocated by Ajzen (1991). Although TPB is originally a western model, it has been widely applied to the eastern context in recent years, even though it has not been widely applied within Chinese context. Hence, the present study also tests the applicability of this western model into mobile payment for hotel reservation with Chinese context. Figure 13 further illustrates the proposed research framework with 15 hypotheses within the context of mobile payment for hotel reservations in China.

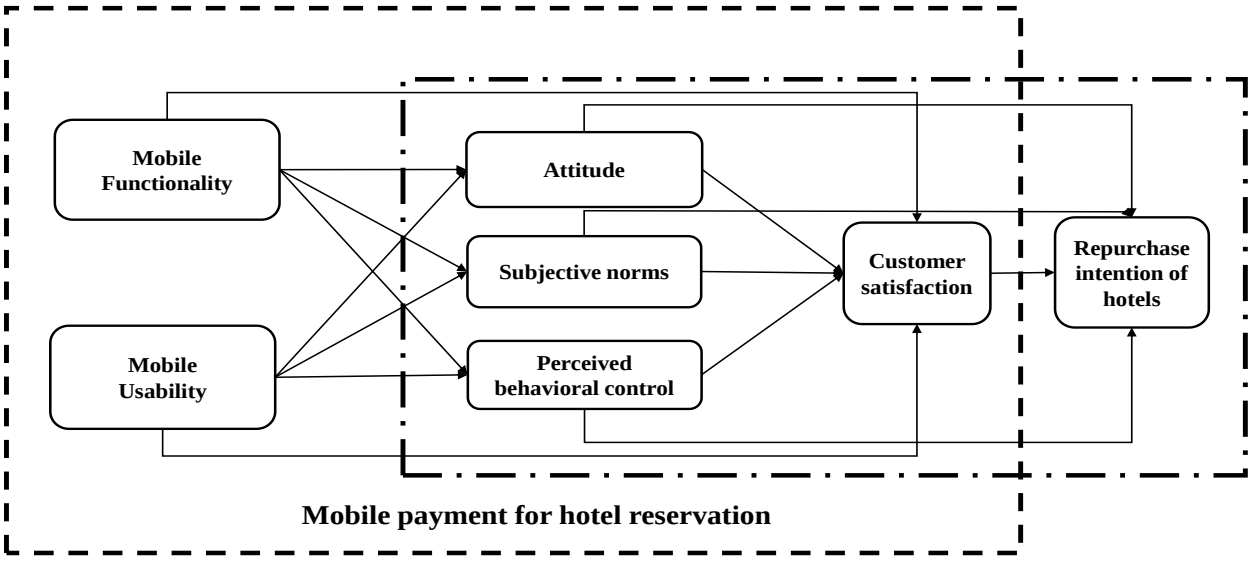


Figure 13. Proposed research framework

Based on the adjustments of Ajzen (1991) and Bai et al. (2008)

3.3 Dimensions and attributes of the proposed research framework

By retrieving the measurements of previous literature, Table 10 summarizes the measurements of each dimension of the proposed research framework within the context of mobile payment for hotel reservations. Five attributes are used to measure functionality toward mobile payment based on the previous studies (Baloglu & Pekcan, 2006; CyberSource, 2015; Maswera, Dawson, & Edwards, 2008). That is, mobile payment information (Baloglu & Pekcan, 2006; Maswera et al., 2008), currency information of the travel destination (Alipay, 2016; Baloglu & Pekcan, 2006), mobile payment flow (CyberSource, 2015), the need of foreign currency convertor, and different dominant types of mobile payment methods (i.e. Alipay, WeChat Pay, Apple Pay) in China.

Based on the previous literature (Lee et al., 2015; Morosan & DeFranco, 2015), five measurements of usability toward mobile payment are included. Mobile payment adoption of different smartphone operation systems is used to measure compatibility (Google, 2013).

Moreover, instant payment notification is included (Paypal, 2016). In addition, convenience, safety, and speed of mobile payment for hotel reservations are considered (Lee et al., 2015; Morosan & DeFranco, 2015).

In terms of the measurements of attitude toward mobile payment, Anand and Sternthal (1990) measured the attitudes in four aspects, that is, from bad to good, from foolish and fun, from unenjoyable to enjoyable, and from unpleasant to pleasant. In recent years, Liébana-Cabanillas et al. (2017) adopted similar measurements of attitudes when applying to mobile payment systems. The present study also adopted the aforementioned four attributes to measure attitude toward mobile payment for hotel reservations.

For the measurements of customer satisfaction within the context of mobile payment for hotel reservations, two questions are included based on the study of Bai et al. (2008): "I am satisfied with mobile payment experience for my most recent hotel reservation." and "My choice of using mobile payment to make my recent hotel reservation is a wise one." Similarly, in reference to the measurements of hotel repurchase intention via mobile payment, based on the previous study of Bai et al. (2008), the following two questions are included: "I will make hotel reservation(s) using mobile payment through the mobile website(s) of OTA(s) in the next 12 months.", and "I will make hotel reservation(s) using mobile payment through mobile APP(s) of OTA(s) in the next 12 months."

Table 10. Dimensions and attributes within mobile payment context

Dimensions	Attributes	References
Mobile functionality (5)	Mobile payment information	Alipay (2016); and Karnouskos (2004)
	Mobile payment flow	CyberSource (2015)
	Currency information	Alipay (2016); and Baloglu and Pekcan (2006)
	Foreign currency convertor	Alipay (2016); and Baloglu and Pekcan (2006)
	Time to complete mobile payment	Yang et al. (2012)
Mobile usability (5)	Adoption of different operation systems	Google (2013)
	Instant mobile payment notification	Paypal (2016)
	Convenience	Lee et al. (2015)
	Speed	Google (2013)
	Safety	Morosan and DeFranco (2015)
Attitude (4)	Bad/Good	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
	Foolish/Fun	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
	Unenjoyable/Enjoyable	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
	Unpleasant/Pleasant	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
Subjective norms (4)	Most people in my social network want me to use mobile payment.	Hsu and Huang (2012)
	Most people in my social network wish me to use mobile payment for hotel reservation.	Hsu and Huang (2012)
	Most people in my social network would support me to use mobile payment for	Hsu and Huang (2012)

	hotel reservation.	
	If people in my social network use mobile payment for hotel reservation, I will use.	Hsu and Huang (2012)
Perceived behavioral control (2)	Self-efficacy: I am confident in using mobile payment.	Ajzen (2002); and Lee et al. (2015)
	Controllability: Mobile payment is not beyond my control.	Ajzen (2002); and Lee et al. (2015)
Customer satisfaction (2)	I am satisfied with mobile payment for my most recent hotel reservation.	Bai et al. (2008)
	My choice of using mobile payment to make hotel reservation is a wise one.	Bai et al. (2008)
Repurchase intention (2)	I will make hotel reservation(s) using mobile payment through mobile website(s) of OTA(s) in the next 12 months.	Bai et al. (2008)
	I will make hotel reservation(s) using mobile payment through the APP(s) of OTA(s) in the next 12 months.	Bai et al. (2008)

3.4 Chapter summary

In summary, this chapter proposes 15 hypotheses based on the conceptual model of website evaluation and theory of planner behavior, and develops the research framework of the present study. Furthermore, dimensions and attributes of the proposed research framework within the context of mobile payment for hotel reservations are provided.

Chapter 4. Research methodology

4.1 Chapter introduction

Chapter 4 discusses the research paradigm and method. In addition, sampling, construct measurement, pilot test, questionnaire survey, data collection, and data preparation are discussed. Furthermore, the measurements of each dimension included in the questionnaire survey are finalized after the pilot test.

4.2 Research paradigm

In terms of the development of research paradigms, in total, there are five stages: traditional (1900-1940s), modern (1950s-1970s), blurred genres (1970-1986), crises of representation (mid-1980s-1990), and post-modern period of experimental ethnography (1990-1995) (Higgs, Horsfall, & Grace, 2009). From philosophical perspective, the topic mobile payment for hotel reservations via OTAs reflects the concept of post-positivism. The antecedent of post-positivism is positivism. The assumption of positivism is that truth is considered as an independent part of the whole with theoretical support, the causes to the problem is clear, and the consequence is possible (Henderson, 2011). The difference between positivism and post-positivism is that compared with positivism, post-positivism moves from a narrow perspective to real-world problem solving. As indicated by Ryan (2006) and Panhwar, Ansari, and Shah (2017), post-positivism connects theory and practice, motivates researchers to explore real-world problems, and makes researchers more committed to their research topics. Regarding the topic mobile payment for hotel reservations, it is a real-world problem; and the present study connects the theory (i.e. conceptual model of website evaluation and theory of planned behavior) and practice. Thus, the present study follows the concept of post-positivism by testing whether theories are applicable to practice.

For each research paradigm, three most important perspectives are ontology, epistemology, and method. Ontology is about critical realism. It means that truth exists but can only be partially comprehended (Riley & Love, 2000). When applying ontology to mobile payment context, the truth is at present, mobile payment has already become a common practice for consumers to use in almost each aspect of travel planning, such as ticket booking (e.g. train/airline/attraction), hotel reservations, and online shopping. The reason may be due to the trend that consumers would like to follow. Nevertheless, the underlying reasons that drive consumers to adopt mobile payment and their repurchase intentions of hotels via mobile payment are not clear. Thus, the present study mainly adopts theory of planned behavior through attitude, subjective norms, and perceived behavioral control to examine how these factors affect customer satisfaction of using mobile payment for hotel reservations, and their repurchase intention of hotels via mobile payment. In reference to epistemology, according to Riley and Love (2000, p. 172), "Objectivism is ideal but can only be approximated." In the present study, to maintain objectivism, a thorough review of the previous literature of the measurements of each dimension was conducted. The dimensions of the proposed research framework are mobile functionality, mobile usability, attitude, subjective norms, perceived behavioral control, customer satisfaction, and repurchase intention within the context of mobile payment for hotel reservations.

4.3 Method

Qualitative research method and quantitative research method are two major research methods. For qualitative research, it is a method that is descriptive in nature. Qualitative research may have some simple frequency descriptions but it does not employ any other statistical techniques. The advantages of qualitative research are it drives an in-depth understanding of the dynamics associated with the concept. In other words, qualitative research can facilitate the

understanding of the phenomena, which moves beyond the initial perception (Bartunek & Seo, 2002). Furthermore, it provides acute insights in building theoretical frameworks and developing scales (Kelle, 2006; Riley & Love, 2000; Wilson & Hollinshead, 2015). Nevertheless, the relationships between different dimensions cannot be tested. The problem of qualitative research also exists in the transferability (Kelle, 2006).

In the present study, a quantitative research method is mainly adopted because the major objectives are to examine the structural relationships among different dimensions rather than simply understand the phenomena, that is, mobile payment for hotel reservations in the present study. Different from qualitative research, quantitative research refers to any researches that use statistical techniques. These techniques can be either simple cross-tabulations or sophisticated multivariate techniques (Crawford-Welch & McCleary, 1992). Nevertheless, the exploratory variables of quantitative research are not easily identified (Kelle, 2006). To summarize, by adopting a quantitative research method, objectivity can be maintained to a large extent; and the associations between different dimensions/attributes can be identified. By mainly adopting a quantitative research method, each relationship in the proposed research framework can be tested and explained clearly by statistical analysis, and the effects can be examined. A qualitative research method is adopted as well by analyzing the comments to further verify the findings of the quantitative research.

4.4 Sampling

Although the best way to investigate any research problem is to collect data from the whole population, it is impossible to collect information from the whole population in reality. Thus, different types of sampling methods have been introduced to best fit for the nature of different studies. In 1950s, Stephan (1950) already pointed out the problems of different

sampling techniques such as the scope and the accuracy of observations; and at present, the problems still exist. Although there is no "best" sampling method, a certain technique that is designed to fit for a particular situation is suggested because the more representative the sample is, the more accurate the result is close to studying the whole population. Three influencing factors that determine the sample representativeness are sampling method, sample size, and response rate (Acharya, Prakash, Saxena, & Nigam, 2013).

4.4.1 Sampling method

There are two types of sampling method: probability sampling and non-probability sampling. Probability sampling is categorized into "simple random sampling", "systematic random sampling", "stratified random sampling", "cluster sampling", "multiphase sampling", and "multistage sampling" (Acharya et al., 2013, pp. 330-333). Simple random sampling refers to that each individual within the population has an equal chance to be selected. Systematic random sampling denotes that the first respondent is selected randomly, and subsequently, every k^{th} number of the subjects is selected as a sample. Stratified random sampling signifies that the samples collected have some shared characteristics such as age and gender. Cluster sampling represents dividing the entire groups into groups/clusters. Geographic area is often regarded as a criterion for clusters. Multiphase sampling and multistage sampling are complex forms of cluster sampling, which are not commonly used unless the samples required are very specific.

Non-probability includes "convenience sampling", "judgment sampling", "quota sampling", and "snowball sampling" (Baker et al., 2013, pp. 91-94). Compared with probability sampling, biases are associated with non-probability sampling. Convenience sampling is a well-known technique that is widely applied, and the ease of targeting potential participants is the availability of volunteer samples. Judgment sampling is largely based on the subjective judgment

of the researcher. Quota sampling is a common non-probability sampling method. The quotas are based on the population proportion. Snowball sampling is based on a selected group to nominate other participates who fit for the study through their social networks. Bias always comes along with for the aforementioned four non-probability sampling techniques.

In the present study, probability sampling method is adopted, and stratified random sampling is selected as a suitable sampling method. Stratified random sampling refers to collecting data from groups which share the same characteristics, such as age, gender, education, and so on (Acharya et al., 2013). The advantage of stratified random sampling is that it reduces the variability and increases the representativeness of the groups. Meanwhile, stratified random sampling reduces the non-sampling error. In the present study, first, based on the emergence and the rapid development of mobile hotel booking using mobile payment in first-tier cities in China, respondents are selected in four first-tier cities, Beijing, Shanghai, Guangzhou, and Shenzhen. Second, in order to fit for the purpose of the present study, respondents who have used mobile payment for smartphone hotel booking at least once are considered. Third, respondents have to use mobile payment for smartphone hotel booking in the past six months (pilot test part will explain the reason), although previous studies indicated that a two-year period is a suitable time period for consumers to recall their online experience (Cheung & Law, 2009; Ip et al., 2010). In conclusion, the common characteristics of the respondents for the present study are respondents from first-tier cities in China who have made hotel reservations through OTAs via mobile payment in the past six months.

4.4.2 Measurement error

Measurement error refers to systematic error or random error. Systematic error is associated with validity whereas random error is related to reliability (Babbie & Mouton, 2001). Thus, to reduce the measurement error, validity and reliability are taken into consideration.

Validity

According to the definition of Bollen (1989), validity refers to whether a variable can be used or adopted to measure what it is supposed to measure. There are three types of measurement validation: content validation, convergent/discriminant validation, and construct validation. To ensure the content validation, the "adequacy of content" is accessed. Two aspects should be taken into consideration. First, key elements are not omitted. Second, inappropriate elements are not included. Although content validation contributes to the measurement validity, it is not complete. In other words, a key indicator can still result in low overall assessment validity. Moreover, the variable may not represent the full content of a systematic concept. Thus, convergent validity and discriminant validity are further considered. Convergent validation is to ensure that the indicators measure the same systematic concept, and discriminant validity is to assess the indicators that represent different concepts.

Thus, to ensure the content validity of the present study, a comprehensive literature review of each dimension within the proposed research framework was conducted. First, key elements were included in each dimension without inappropriate elements. Second, different terms in literature were used to represent the same concept. These terms were then merged and summarized to indicate the same systematic concept. Finally, based on the above-mentioned criteria, relevant indicators were selected to present different concepts/dimensions in the proposed research framework.

Reliability

Reliability refers to the random error. In other words, even if the application of a given measurement is repeated, the results are not consistent. Thus, reliability is required to ensure that the same respondent has the same response if the same question is asked again (Santos, 1999). That is, only if reliable and stable response can be obtained from a repeated test can the reliability be achieved.

In order to make sure that the variables can be used as predictors for a particular dimension, an effective tool called Cronbach's alpha, a numerical coefficient of reliability is introduced in 1950s and is still widely adopted at present (Cronbach, 1951; Vaske, Beaman, & Sponarski, 2017). Cronbach's alpha is an index to check whether it represents the true score of the underlying constructs/dimensions. The higher the score, the more reliable can the variables reflect the construct. A score of 0.7 is often regarded as an acceptable coefficient although lower thresholds are also accepted sometimes (Nunnally, 1978). In the present study, Cronbach's alpha coefficient was calculated for the attributes involved in each dimension in the proposed research framework.

4.5 Construct measurements

In the present study, the proposed research framework has seven constructs. That is, mobile functionality, mobile usability, attitude, subjective norms, perceived behavioral control, customer satisfaction, and repurchase intention within the context of mobile payment for hotel reservations. In terms of functionality and usability, the common measurement scale is five-point Likert-scale. For example, Li et al. (2017, p. 6) examined the impact of website quality on online booking intentions. To measure website quality, this study provided statements such as "The website adequately meets my information needs." and "The information on the website is

effective." and asked the respondents to indicate their level of agreement of the statements, the answers range from strongly disagree (1) to strongly agree (5). In reference to the three most important elements that are involved in theory of planned behavior, attitude, subjective norms, and perceived behavioral control, most of the previous studies adopted five-point Likert-scale measurement. For example, by applying the extended theory of planned behavior, Park, Hsieh, and Lee (2017, p. 123) investigated the intention of Chinese students travelling to Japan. The study also applied five-point Likert-scale measurement, ranging from strongly disagree (1) to strongly agree (5) for students to rate the statements. For attitude, statement such as "For me, traveling in Japan is valuable." was provided for the students to indicate their level of agreement. In terms of subjective norms, students were asked to express their level of agreement to the statement such as "I will travel to Japan because it is popular among my friends/family." In reference to perceived behavioral control, students were asked to indicate their level of agreement to the statement such as "I feel nothing will prevent me from traveling to Japan if I want." For both of the aforementioned studies, repurchase intention is measured by a five-point Likert-scale measurement, ranging from strongly disagree (1) to strongly agree (5). In the study of Li et al. (2017, p. 6), one of the statements to measure online booking intention of consumers is "I may book hotel rooms using the website in the next 12 months." whereas in the study of Park et al. (2017, p. 123), one of the statements is "I will travel to Japan with friends/family within 24 months." Regarding customer satisfaction, some studies apply five-point scale, ranging from very/extremely dissatisfied to very/extremely satisfied while other studies adopt seven-point scale, ranging from strongly/extremely disagree to strongly/extremely agree. For example, Oh et al. (2017) summarized the studies published from 2000 to 2015 and found that a large number of studies adopt seven-point scale measurement. On the other hand, a minority of studies

adopted other measurement scales such as a 10-point rating scale and a 7-point semantic differential scale (DiPietro & Peterson, 2017; Pansari & Kumar, 2017). In general, previous studies mainly adopt five-point Likert-scale measurements, ranging from strongly disagree (1) to strongly agree (5), seven-point Likert-scale measurements, ranging from strongly disagree (1) to strongly agree (7), or five-point scale/seven-point scale to measure the constructs.

Based on the previous studies and the improvements, a seven-point Likert-scale measurement with score label associated with each score is applied for each construct in the present study to make the measurements clear and comprehensive. The reason for applying seven-point Likert-scale measurement is that compared with five-point Likert-scale measurement, it has more scale points but not as much as that of 11-point Likert-scale measurement. As psychometric literature suggests that it is better to have more scale points but it starts to have a diminish return after 11-point (Nunnally, 1978). Thus, a seven-point Likert-scale measurement can maintain a good balance in terms of the scale points and the quality of responses. Meanwhile, a score label is attached to each score for respondents to have a clear understanding of each item involved in each construct.

To measure the past experience of users who adopted mobile hotel reservations, categorical variables, also known as discrete variables, are adopted in the present study. In other words, nominal scale measurements are applied. There are five choices of smartphone operation system for consumers to choose, that is, Android system, iOS system, Windows OS system, Symbian system, and others. In addition, there are seven choices of OTAs that allow respondents to choose for their recent hotel reservation, that is, Ctrip, Qunar, Tuniu, CY, Mafengwo, Lvmama, and others. Both of the aforementioned nominal scale variables are regarded as multinomial variables. Regarding the platform that respondents used for their most recent hotel

reservation, two options are provided: mobile website and mobile application (app). These two variables are dichotomous variables. In reference to the social-demographic information, both discrete (i.e. nominal, dichotomous, ordinal) and continuous variables (i.e. interval, ratio) are applied. For gender, two options are provided, male and female, and they are dichotomous variables. For education level, four options, secondary school or below, college degree, undergraduate degree, and postgraduate degree are provided. For age, five options, 18 - 27; 28 - 37; 38 - 47; 48 - 57; and 58 or above are provided. In reference to monthly household income, five options, RMB 15,000 or below; between RMB 15,001 and 25,000; between RMB 25,001 and 35,000; between RMB 35,001 and 45,000; and RMB 45,001 or above are provided. These aforementioned three variables are considered as ordinal or interval variables. In summary, the seven constructs adopt seven-point Likert-scale measurement with score label associated with each score whereas the remaining parts adopt discrete (i.e. nominal, dichotomous, ordinal) measurements.

4.6 Pilot test

Before data collection, a pilot test was conducted in Shanghai in August, 2016. The main purpose of the pilot test is to check the wording and estimate the time required to complete the questionnaire survey. In other words, the pilot test checks whether the respondents can understand the questionnaire, and whether the expression of each statement is clear, and how much time is required to complete the questionnaire survey. It is necessary to conduct the pilot test because it helps to identify whether research protocols can be followed or not; and whether the proposed instruments are appropriate or not. Although pilot test is not a guarantee of the success of the main study, the likelihood of the success of the main study can be largely increased by the pilot test.

Since the target samples of the respondents are Chinese, a native Chinese speaker translated the questionnaire from English (Appendix I) to Chinese (Appendix II). In total, 23 paper-based Chinese questionnaires were distributed to the respondents, and they provided comments and suggestions to the PhD student face to face after completing the questionnaires. After 23 questionnaires were collected back, the PhD student analyzed the feedbacks of the respondents, and improved the questionnaire, particularly the expressions to achieve the relevant research objectives. Back translation was also adopted to provide an extra check to ensure the quality of questionnaire translation.

4.6.1 Profile of the respondents in pilot test

Table 11 indicates the profile of 23 respondents in the pilot test. That is, gender, age, and user experience. Table 12 further summarizes the profile of these 23 respondents. The gender of the respondents is relatively equally distributed, with males occupy nearly 48%, and females occupy more than 52%. For age groups, among 23 pilot respondents, the youngest respondent is 19 years old, and the oldest respondent is 59 years old. Since the gap between the youngest respondent and the oldest respondent is 40, the possible and feasible age groups can be five, with an age range of nine for each age group. That is, 19 – 28, 29 – 38, 39 – 48, 49 – 58, and 59 or above. Nearly 75% of the respondents are from 19 to 28 (56.5%), and from 29 to 38 (17.4%). According to rules and regulations in China, individuals who are aged over 18 are regarded as adults. Thus, the age groups in the actual study are adjusted to five age groups. That is, 18 - 27, 28 – 37, 38 – 47, 48 – 57, and 58 or above. Over the past two years, the majority of the respondents (82.60%) have one or two times of mobile hotel reservation experience. One respondent does not have mobile hotel reservation experience, one respondent has 3-time

experiences of mobile hotel reservation, and another two respondents have more than 5-time experiences of mobile hotel reservation.

Table 11. Profile of 23 pilot respondents

No. of the respondents	**Gender**	**Age**	**User experience (times)**
1	F	26	1
2	F	29	0
3	F	27	1
4	F	26	1
5	M	36	3
6	F	45	5
7	M	59	1
8	M	25	1
9	M	25	1
10	M	25	1
11	F	27	1
12	M	27	2
13	M	35	1
14	M	26	1
15	M	26	1
16	M	42	1
17	F	41	1
18	F	24	1
19	F	32	2
20	F	27	1
21	F	19	1
22	M	21	2
23	F	42	6

Table 12. A summary of the profile of 23 respondents

Respondents	Frequency	Percentage (%)
Gender		
Male	11	47.8
Female	12	52.2
Age groups		
19 - 28	13	56.5
29 - 38	4	17.3
39 - 48	5	21.7
49 - 58	0	0.00
59 or above	1	4.35
User experience		
0	1	4.3
1-2	19	82.6
3-4	1	4.4
5 or more	2	8.7

4.6.2 Findings of the pilot test

The finding of the pilot test shows that it took around 8 – 12 minutes for respondents to complete the questionnaire survey. Furthermore, when communicated with the respondents, almost all of the respondents raised their concerns that they cannot remember the detailed experience of hotel reservations in the last two years. They can only remember the experience up to six months ago. Thus, the time frame of user experience was changed to "in the past six months".

Comments and suggestions raised by the respondents of the pilot test can be categorized into three aspects: expression, choices, and formatting (Table 13). In terms of expression, for ii). mobile hotel reservation, regarding the statement "The information about check-in time is clear."

and “The information about check-out time is clear.”, five respondents suggested to add “earliest” and “latest” respectively before “check-in time.” to make the statements clearer. Furthermore, 11 respondents recommended adding the statement of the overall satisfaction, that is “I am satisfied with the hotel information provided by OTA.” in the hotel reservation part. This suggestion is also adopted. In terms of iii). mobile payment for hotel reservations, for part II, nine respondents suggested changing the section D title “subjective norms” to “social norms” to make it more understandable to the respondents. This suggestion is also adopted.

In reference to choices, for i). user experience, 11 respondents suggested to add the question about the smartphone brand. Hence, this question was added to the user experience part. In addition, eight respondents indicated that they used Alitrip and five respondents said that they used eLong to make hotel reservations in the past six months. Thus, apart from the seven choices provided originally, two more choices, Alitrip and eLong were added. In addition, in terms of mobile hotel reservation, eight respondents suggested to add the change policy and cancellation policy to make this part more thorough. Thus, two more statements have been added. One is “It provides detailed information about change policy.”, and another is “It provides detailed information about cancellation policy.” Moreover, for one question “When did you use mobile payment?” in Part II, section B – Mobile payment process, the choices provided are “When I make reservation”, and “When I check-out”, six respondents said that they have experienced booking hotels using mobile payment when they check-in the hotel. Thus, the third choice “When I check-in” was added. In addition, one respondent pointed out that for education level, a choice “college degree” exists between “secondary school or below” and “undergraduate degree”. Hence, choice “college degree” was added. Furthermore, 15 respondents suggested adding “N.A.” to the statements in each part if applicable. For example, section Part II – section

I. hotel reservation, “N.A.” was added to the statements in the interaction part such as “It is easy to post comments.” since not all the consumers post comments on OTAs. Last but not least, seven respondents suggested adding one part for respondents to provide their comments or reasons of the evaluations. Thus, “Please feel free to provide reasons/comments to any of your evaluations.” was added as the last part of Part I and Part II. The aforementioned suggestions were adopted.

Regarding formatting, the pilot test of questionnaire survey includes three parts together: Part I. user experience, Part II – section I. hotel reservation, Part II – section II. mobile payment, and Part III. socio-demographic information. 20 of the 23 respondents suggested separating each part to make the questionnaire clearer. This suggestion was adopted.

Table 13. Suggestions from 23 respondents

Aspects	**Expression**		**Choices**		**Formatting**	
	Suggestions	**Decision**	**Suggestions**	**Decision**	**Suggestions**	**Decision**
i). User experience	N.A.	N.A.	Add the question about the smartphone brand.	Adopted	N.A.	Adopted
			Add choices eLong and Alitrip as additional OTAs.	Adopted		
ii). Mobile hotel reservation	1. For Part I, section A – hotel reservation (item 6 and 7), add "earliest" before check-in time, and latest before "check-out" time to make the statements clearer.	Adopted	Add the change policy for Part I, section A - hotel reservation.	Adopted	N.A.	
	2. Please add "I am satisfied with the hotel information that is provided by OTA" to Part I, section A – hotel reservation part.	Adopted	Add the cancellation policy for Part I, section A -hotel reservation.	Adopted	N.A.	
iii). Mobile payment for hotel reservation	For part II, change the title of section D "subjective norms" to "social norms" to make it more understandable.	Adopted	For the question is Part II, section B – Mobile payment process "When did you use mobile payment?", add the choice "When I check in" apart from "When I make reservation" and "When I check out".	Adopted	N.A.	
iv). Socio-demographic information	N.A.		For education level, add "college degree" between "secondary school or below" and "undergraduate degree".	Adopted		
Overall	N.A.	N.A.	Add "N.A." to statements in each part if applicable.	Adopted	Separate part I, part II, and part III	Adopted
			Add one part for respondents to provide reasons/comments for any of their evaluations.	Adopted		

4.7 Questionnaire survey design

A common quantitative survey method, a questionnaire survey is adopted in the present study to identify the impacts of functionality and usability toward mobile payment on the repurchase intention of hotels. Traditionally, a paper-based questionnaire survey is adopted. To improve the efficiency of the present study, online questionnaire survey was adopted. The respondents who fulfill the sample requirements filled in the questionnaire survey by computers, tablets, or their smartphones. The measurements of each dimension were retrieved and adjusted from the previous literature and the findings of the pilot study. Meanwhile, experts in the field of information and communications technology provided some comments and suggestions to improve the survey questionnaire. In summary, the time frame of sample requirement was changed from "in the past two years" to "in the past six months" for respondents to recall their experience clearly. For the user experience, apart from the seven choices of OTAs provided originally, two more choices, Alitrip and eLong were added.

For mobile hotel reservation part, regarding the statements "The information about check-in time is clear." and "The information about check-out time is clear.", "earliest" and "latest" were added before "check-in time" and "check-out time" respectively to make the statements clearer. In addition, attributes of "change policy" and "cancellation policy" were added to make hotel reservation part more thorough. In terms of mobile payment for hotel reservation, based on the literature review and the findings of the pilot test, Table 14 shows the dimensions and attributes of the proposed research framework. In total, five attributes are used to measure functionality toward mobile payment based the measurements of previous studies (Baloglu & Pekcan, 2006; CyberSource, 2015; Maswera et al., 2008) and the findings of the pilot test. That is, mobile payment information (Baloglu & Pekcan, 2006; Maswera et al., 2008), currency

information of the travel destination, foreign currency convertor (Alipay, 2016; Baloglu & Pekcan, 2006), mobile payment flow (CyberSource, 2015), and three dominant types of mobile payment (i.e. Alipay, WeChat Pay, Apple Pay) in China. Since the respondents in the pilot test mentioned that it only took a few seconds to complete the mobile transaction, time to complete the mobile payment transaction is not considered (Yang et al., 2012). Finally, based on the previous literature (Lee et al., 2015; Morosan & DeFranco, 2015) and the findings of the pilot test, six attributes of usability toward mobile payment are included. Although Zhou (2013) pointed out the importance of accessibility and Morosan and DeFranco (2015) unearthed the issue of mobility, the results of the pilot test indicated that at present, conduct mobile payment anywhere at any place and at any time is no longer a problem. Instead, it is found that consumers conduct mobile payment at different time markers: when consumers make reservations, when consumers check-in or when consumers check-out. Thus, different time markers when consumers use mobile payment for hotel reservations are included. In addition, mobile payment adoption of different smartphone operation systems is used to measure compatibility. Moreover, instant payment notification is included (Paypal, 2016). Furthermore, safety, speed, and convenience of mobile payment are considered (Chen & Lin, 2018; Google, 2013). The attributes to measure the remaining five dimensions, attitude, subjective norms, perceived behavioral control, customer satisfaction, and repurchase intention within the context of mobile payment for hotel reservations remain the same as the literature after the pilot test. Furthermore, the design of questionnaire survey considers the suggestions of the pilot test in terms of expressions, choices, and formatting. The designed English questionnaire of the present study is indicated in Appendix III, and the designed Chinese questionnaire is indicated in Appendix IV.

Table 14. Dimensions and attributes within mobile payment context after pilot test

Dimensions	Attributes	References
Mobile functionality (5)	Mobile payment information	Alipay (2016); and Karnouskos (2004)
	Mobile payment flow	CyberSource (2015)
	Currency information	Alipay (2016); and Baloglu and Pekcan (2006)
	Foreign currency convertor	Alipay (2016); and Baloglu and Pekcan (2006)
	Types of mobile payment (i.e. Alipay, WeChat Pay, Apple Pay)	Alipay (2016); Appleinsider (2016); and WeChat Pay (2016)
Mobile usability (6)	Time markers of making mobile payment (i.e. Make reservation, check-in, check-out)	The finding of pilot test
	Adoption of different operation systems	Google (2013)
	Instant mobile payment notification	Paypal (2016)
	Convenience	Lee et al. (2015)
	Speed	Google (2013)
	Safety	Morosan and DeFranco (2015)
Attitude (4)	Bad/Good	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
	Foolish/Fun	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)

	Unenjoyable/Enjoyable	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
	Unpleasant/Pleasant	Anand and Sternthal (1990); and Liébana-Cabanillas et al. (2017)
Subjective norms	Most people in my social network want me to use mobile payment.	Hsu and Huang (2012)
(4)	Most people in my social network wish me to use mobile payment for hotel reservation.	Hsu and Huang (2012)
	Most people in my social network would support me to use mobile payment for hotel reservation.	Hsu and Huang (2012)
	If people in my social network use mobile payment for hotel reservation, I will use.	Hsu and Huang (2012)
Perceived behavioral control	Self-efficacy: I am confident in using mobile payment.	Ajzen (2002); and Lee et al. (2015)
(2)	Controllability: Mobile payment is not beyond my control.	Ajzen (2002); and Lee et al. (2015)
Customer satisfaction	I am satisfied with mobile payment for my most recent hotel reservation.	Bai et al. (2008)
(2)	My choice of using mobile payment to make hotel reservation is a wise one.	Bai et al. (2008)
Repurchase intention	I will make hotel reservation(s) using mobile payment through mobile website(s) of	Bai et al. (2008)
(2)	OTA(s) in the next 12 months.	
	I will make hotel reservation(s) using mobile payment through the APP(s) of OTA(s) in the next 12 months.	Bai et al. (2008)

4.8 Data collection

Data were collected by a third-party survey company and the PhD student. The reason for choosing third-party survey company is that the samples that are needed for the present study are unobservable. In other words, there is a high probability that the respondent the PhD student approach does not meet the sample requirement, which makes data collection difficult and not efficient. By contrast, if the data collection is conducted by a third-party survey company, this problem can be avoided by adding a screening question to approach the target samples accurately. Considering 5% standard deviation and 5% sample size per margin of error at 99% confidence interval, the necessary sample size = $(\text{Z-score})^2$ * StdDev*(1-StdDev) / $(\text{margin of error})^2$ = $2.576^{2*}0.5*0.5/0.05^2$ = 663.5776. In addition, considering 80% response rate, the present study should collect data from at least 829.472 (663.5776/0.8) respondents. Based on the above information, third-party survey company is responsible for collecting 800 questionnaires and the PhD student is responsible for collecting 100 questionnaires to minimize the sampling error.

Three most popular online survey companies in China are considered as the potential choices of third-party survey companies for the present study. That is, Tencent Questionnaire (http://wj.qq.com/index.html), Wenjuan Website (https://www.wenjuan.com/), and Sojump Company (https://www.sojump.com/). Tencent Questionnaire was established in 2014, which is an online platform for questionnaire survey. The advantages of Tencent Questionnaire are that the platform is free for questionnaire survey, and the editing process is simple. Moreover, the questionnaire designed can be adapted to multiple terminals, such as laptops or smartphones (Tencent questionaire, 2016). Nevertheless, it does not offer the sample service. In other words, the PhD student cannot target the respondents accurately according to the sample requirements.

Another popular online survey company in China is Wenjuan Website, which was established in July 2013. It cooperates with more than 10,000 companies/organizations/universities (Wenjuan website, 2016). The advantages of this company are it has both free questionnaire survey service and sample service. For the sample service, the staff will be responsible for inputting the questionnaire (i.e. RMB 299/once up), and questionnaire survey service can also be tailor-made. That is to say, it is possible to communicate with the personnel to require sample service. Nonetheless, the disadvantages are the time required for data collection is not clearly stated on the website; and it is expensive. The most popular and reliable online survey company in China is Sojump, which was established in December 2005, under the Shanghai Information Technology Co. cycle. It is a professional online questionnaire operation website for conducting self-designed questionnaire surveys (Sojump, 2017). It has over 2.6 million personnel in their sample databases; and provides sample service as well. Moreover, the time required for data collection is assured. Depending on the items included in the questionnaire, it charges reasonable price for sample service. In addition, the company has several criteria to ensure the quality of the respondents in their sample databases, such as the time required to answer the questionnaire and the IP address of the respondents. By comparing with the aforementioned three popular online survey companies in China, Sojump is selected because of its large databases, the reasonable price charged for sample service, and the assurance of data collection time. Furthermore, manual sorting is considered to ensure the quality of the questionnaires collected back.

The third-party survey company Sojump collected data from January 4, 2017 to January 17, 2017. In total, 800 questionnaires were collected back. Sojump has several criteria to ensure the quality of the data for the present study. First, Sojump limited the IP address of the respondents to the first-tier cities in China. In other words, if the respondents are not from first-

tier cities in China, they are not qualified to fill in the questionnaire. The reason to select respondents in first-tier cities in China is that the economic and industrial structures of first-tier cities are different compared with that of second-tier cities or below. In addition, when introducing something new in China, first-tier cities are normally the pilot cities. Only if something new works well in first-tier cities will it be introduced to second-tier cities or below. Second, if the answer of the screening question "Have you made any hotel reservation through online travel agency via your smartphone and used mobile payment for the transaction over the past six months?" is "No", the respondents are qualified to fill in the questionnaire. Third, each respondent has to spend at least 5 seconds to answer each question.

The PhD student collected data from Beijing, Shanghai, Guangzhou, and Shenzhen from January 10, 2017 to February 15, 2017. In total, 101 questionnaires were collected back. During this time period, the student asked the friends who have networks in the aforementioned four first-tier cities to share the questionnaires among their social networks. The screening question is "Have you ever made hotel reservation through online travel agency via your smartphone and used mobile payment for the transaction over the past six months?" If the answer of the respondent is "Yes", the survey will be continued. If the answer of the respondent is "No", the survey will be ended. The PhD student collected data in Guangzhou in person from January 13, 2017 to January 14, 2017. The respondents were selected in the lobby of DoubleTree Hilton in Guangzhou by convenience sampling. The PhD student approached the respondents by asking two screening questions: 1. "Are you from first-tier cities (i.e. Beijing, Shanghai, Guangzhou, Shenzhen) in China?" and 2. "Have you ever made hotel reservation through online travel agency via your smartphone and used mobile payment for the transaction over the past six months?" If the answers of both questions are yes, and they agreed to fill in the questionnaire,

the PhD student asked them to screen the QR code of the questionnaire and filled in the questionnaire via their smartphones. A small present (i.e. PolyU pin or PolyU pen) was provided if the respondents completed the questionnaire. The PhD student also collected data in Shamian Island, which is a famous attraction with ancient architectural complex in Guangzhou. Similarly, two screening questions were asked to determine whether the respondent is the target sample. The PhD student then collected data in Shenzhen from January 15, 2017 to January 17, 2017. Data were collected in major shopping malls (i.e. COCO Park and KK Mall) in Shenzhen. Similar procedures were applied. In total, the PhD student collected 101 questionnaires back.

4.9 Data preparation

For the data collected by Sojump, the standard time to complete the questionnaire that sets by Sojump is the total number of items involved in the questionnaires multiply by time used to complete each item (i.e. 5 seconds). That is, 64*5 = 320 seconds. The 800 questionnaires collected were further screened to exclude the outliers and the respondents who do not meet the sample requirement. The findings showed that nine respondents did not use OTAs for their hotel reservations; instead, they used the official websites or hotel apps to make hotel reservations. In addition, one respondent used the laptop to book hotels. Thus, the aforementioned 10 respondents are excluded because they do not fulfill the sample requirement. In addition, two respondents indicated that the maximum mobile payment amount for hotel reservation that he/she can accept is RMB 0; one respondent revealed that the maximum mobile payment amount for hotel reservation that he/she can accept is RMB 20. The maximum mobile payment amount that these three respondents indicate does not match with the minimum transaction amount of hotel reservation. Therefore, they are regarded as outliers. In total, 787 valid questionnaires were used for further analysis.

The PhD student herself tested the time to complete the questionnaire and found that it takes at least 210 seconds to complete. If calculating 5% confidence interval, the minimum time to complete the questionnaire is 199.5 seconds. For the 101 questionnaires collected by the PhD student, two respondents did not use OTAs to make hotel reservations in the past six months, five respondents who completed the questionnaire in 114, 121, 140, 154, and 169 seconds respectively, which are less than 320 seconds (i.e. company standard), and even less than 199.5 seconds (i.e. minimum time to complete the questionnaire). Hence, these seven respondents are regarded as outliers. In addition, one respondent used hotel's own app to book the hotel. Hence, the respondent is not considered as a valid sample. Furthermore, one respondent indicated that the maximum mobile payment amount for hotel reservation that he/she can accept is RMB 50, which is less than the minimum transaction amount for hotel reservation. After the screening process, 92 questionnaires are regarded as valid questionnaires for further analysis.

In order to test the homogeneity for 787 valid data collected by Sojump and 92 valid data collected by the PhD student herself, Chi-Square test was conducted. Table 15 indicates the results of Chi-Square test. Source 1 is the data collected by Sojump whereas source 2 is the data collected by the student herself. In terms of gender, source 1 has 362 males (46%) and 425 females (54%); whereas source 2 has 50 males (54.3%) and 42 females (45.7%). No significant differences were found in terms of gender [χ^2 (1, N = 879) = 2.306, p = 0.129 > 0.05]. For age groups, there are five groups in total. In source 1, 190 respondents (24.1%) are aged from 18 to 27; 389 respondents (49.4%) are aged from 28 to 37; 172 respondents (21.9%) are aged from 38 to 47; 30 respondents (3.8%) are aged from 48 to 57; and only 6 respondents (0.8%) are aged from 58 or above. In source 2, 27 respondents (29.3%) are aged from 18 to 27, 42 respondents (45.7%) are aged from 28 to 37, 16 (17.4%) respondents are aged from 38 to 47, 5 respondents

(5.4%) are aged from 48 to 57, and only 2 respondents (2.2%) are aged from 58 or above. Similarly, no significant differences were found in terms of age groups [χ^2 (4, N = 879) = 4.259, p = 0.372 > 0.05]. For education level, respondents are categorized into two categories: one is below undergraduate degree; and another is undergraduate degree or above. In source 1, only 34 respondents (4.3%) have degree below undergraduate, and 753 respondents (95.7%) have undergraduate degree or above. In source 2, seven respondents (7.6%) have degree below undergraduate and 85 respondents (92.4%) have undergraduate degree or above. No significant differences were found in terms of education level [χ^2 (1, N = 879) = 2.003, p = 0.157 > 0.05]. For monthly household income, in source 1, 247 respondents (31.4%) have monthly household income from RMB 15,000 or below; 307 respondents (39.0%) have monthly household income from RMB 15,001 to 25,000; 133 respondents (16.9%) have monthly household income from RMB 25,001 to 35,000; 46 respondents (5.8%) have monthly household income from RMB 35,001 to 45,000; 54 respondents (6.9%) have monthly household income from RMB 45,001 or above. In source 2, 31 respondents (33.7%) have monthly household income from RMB 15,000 or below; 27 respondents (29.3%) have monthly household income from RMB 15,001 to 25,000; 14 respondents (15.2%) have monthly household income from RMB 25,001 to 35,000; 11 respondents (12%) have monthly household income from RMB 35,001 to 45,000; and 9 respondents (9.8%) have monthly household income from RMB 45,001 or above. Still, no significant differences were found in terms of age groups [χ^2 (4, N = 879) = 8.027, p = 0.091 > 0.05].

Result of Chi-Square test shows that no significant differences are found in terms of the demographic information of the respondents from two sources. Thus, 787 valid data collected by Sojump and 92 valid data collected by the PhD student herself can be combined for further

analysis. Regarding the topic mobile payment, a majority of the recent articles have investigated the acceptance of mobile payment among consumers and their recommendation intention; and the most commonly used methods are regression analysis or structural equation modeling (Oliveira et al., 2016; Zhou, 2013). If the present study only adopts regression analysis, the relationships among different dimensions can be tested, but the structure of the proposed research framework cannot be examined. Hence, structural equation modeling is selected as an appropriate method in the present study to test the relationships among different dimensions and to examine the structure of the proposed research framework so as to meet the research objectives.

Table 15. Chi-Square test for homogeneity

	Source 1[a] (N = 787)					Source 2[b] (N = 92)					Total (N = 879)					χ^2	df	p
Gender	Count	Expected Count	% within Sample source	% within Gender	% of Total	Count	Expected Count	% within Sample source	% within Gender	% of Total	Count	Expected Count	% within Sample source	% within Gender	% of Total	2.306	1	0.129
Male	362	368.9	46.0%	87.9%	41.2%	50	43.1	54.3%	12.1%	5.7%	412	412.0	46.9%	100.0%	46.9%			
Female	425	418.1	54.0%	91.0%	48.4%	42	48.9	45.7%	9.0%	4.8%	467	467.0	53.1%	100.0%	53.1%			
Total	787	787.0	100.0%	89.5%	89.5%	92	92.0	100.0%	10.5%	10.5%	879	879.0	100.0%	100.0%	100.0%			
Age group																4.348	4	0.361
18 - 27	189	193.4	24.0%	87.5%	21.5%	27	22.6	29.3%	12.5%	3.1%	216	216.0	24.6%	100.0%	24.6%			
28 - 37	389	385.9	49.4%	90.3%	44.3%	42	45.1	45.7%	9.7%	4.8%	431	431.0	49.0%	100.0%	49.0%			
38 - 47	173	169.2	22.0%	91.5%	19.7%	16	19.8	17.4%	8.5%	1.8%	189	189.0	21.5%	100.0%	21.5%			
48 - 57	30	31.3	3.8%	85.7%	3.4%	5	3.7	5.4%	14.3%	0.6%	35	35.0	4.0%	100.0%	4.0%			
58 or above	6	7.2	0.8%	75.0%	0.7%	2	0.8	2.2%	25.0%	0.2%	8	8.0	0.9%	100.0%	0.9%			
Total	787	787.0	100.0%	89.5%	89.5%	92	92.0	100.0%	10.5%	10.5%	879	879.0	100.0%	100.0%	100.0%			
Education																2.003	1	0.157
College degree below	34	36.7	4.3%	82.9%	3.9%	7	4.3	7.6%	17.1%	0.8%	41	41.0	4.7%	100.0%	4.7%			
College degree or above	753	750.3	95.7%	89.9%	85.7%	85	87.7	92.4%	10.1%	9.7%	838	838.0	95.3%	100.0%	95.3%			
Total	787	787.0	100.0%	89.5%	89.5%	92	92.0	100.0%	10.5%	10.5%	879	879.0	100.0%	100.0%	100.0%			
Income (RMB)																7.858	4	0.097
15,000 or below	247	248.9	31.4%	88.8%	28.1%	31	29.1	33.7%	11.2%	3.5%	278	278.0	31.6%	100.0%	31.6%			

15,001 to 25,000	307	299.0	39.0%	91.9%	34.9%	27	35.0	29.3%	8.1%	3.1%	334	334.0	38.0%	100.0%	38.0%
25,001 to 35,000	133	131.6	16.9%	90.5%	15.1%	14	15.4	15.2%	9.5%	1.6%	147	147.0	16.7%	100.0%	16.7%
35,001 to 45,000	47	51.9	6.0%	81.0%	5.3%	11	6.1	12.0%	19.0%	1.3%	58	58.0	6.6%	100.0%	6.5%
45,001 or above	53	55.5	6.7%	85.5%	6.0%	9	6.5	9.8%	14.5%	1.0%	62	62.0	7.1%	100.0%	7.1%
Total	787	787.0	100.0%	89.5%	89.5%	92	92.0	100.0	10.5%	10.5%	879	879.0	100.0%	100.0%	100.0%

Note:

a. Source 1 is the data collected by the data collection company (i.e. Sojump).

b. Source 2 is the data collected by the PhD student herself.

4.10 Chapter summary

In summary, this chapter mainly introduces the research paradigm, method, sampling, construct measurements, pilot test, questionnaire survey design, and data collection. The detailed information about survey population and survey method is provided. Under sampling, sampling method and measurement error are discussed. Furthermore, data preparation before data analysis is illustrated.

Chapter 5. Data analysis and findings

5.1 Chapter introduction

Chapter 5 introduces multivariate data analysis methods that the present study is based on. Three major data analysis methods, principle component analysis, exploratory factor analysis, and structural equation modeling are employed in the present study. In addition, the mediating effects of attitude, subjective norms, and perceived behavioral control on the relationships between mobile functionality and customer satisfaction, mobile usability and customer satisfaction are examined. Moreover, the mediating effects of customer satisfaction on the relationships between attitude and repurchase intention, subjective norms and repurchase intention, and perceived behavioral control and repurchase intention are examined within the context of mobile payment for hotel reservations.

5.2 Descriptive statistics

Descriptive statistics provides an overview of the general information of the respondents. It normally includes the socio-demographic information of the respondents, such as nationality, age, gender, education level, and income. To make this part more comprehensive, the present study includes two parts, one part is user experience and another part is socio-demographic information. Table 16 shows the information of user experience, and Table 17 indicates the socio-demographic information.

All of these 879 respondents have made hotel reservations through OTAs via their smartphones (i.e. mobile websites or mobile app), and used mobile payment to complete the transaction in the past six months. Regarding the user experience of the respondents, in terms of smartphone brand, 51.0% of the respondents used iPhone for their hotel reservations, 21.7% of them used Huawei for their hotel reservations, and 7.8% of the respondents used MI for their

hotel reservations. The findings show that the majority of the respondents (80.5%), that is, the sum of the aforementioned respondents used iPhone, Huawei, and MI for hotel reservations. In terms of the smartphone operation system that respondents used for hotel reservations, the findings show that 47.4% of the respondents used Android system and 51.4% of them used iOS system. In other words, Android and iOS smartphone operation systems dominated the market of smartphone operation system in first-tier cities in China (98.8%); and they were relatively equally distributed, although according to Statista (2017a), the market share of Android smartphone operation system occupied 81.3% and that of iOS only occupied 8.1% in January 2017 in China. In reference to the OTAs that respondents used for hotel reservations, Ctrip occupied 55.7% of the market share, followed by Qunar (17.5%), and Alitrip (8.0%). Results show that these top three OTAs occupied a total of 81.2% (i.e. the sum of Ctrip, Qunar, and Alitrip) of OTA markets for hotel reservations in first-tier cities in China. The findings are similar to that of China's online travel market overview in the first quarter of 2017. Ctrip occupied 35.2% of the market share, followed by Qunar (17.3%), and Alitrip (13.6%) in terms of hotel reservation (China Internet Watch, 2017a). Regarding the platform that respondents used for hotel reservations, mobile app occupied an absolute majority (82.4%). In terms of mobile payment time points, respondents can choose different time points to purchase hotel rooms. Most of the respondents purchased hotel rooms using mobile payment when they made hotel reservations (80.5%), while the remaining respondents paid hotel room charge using mobile payment at the moment when they did check-in or check-out of the hotel. For mobile payment methods that the respondents used for hotel reservations, Alipay (75.8%) was dominating mobile payment market in the first-tier cities in China, followed by WeChat Pay (18.4%), although the

findings of China Internet Watch (2017b) indicated that China's third-party mobile payment is led by both Alipay (53.7%) and WeChat Pay (40.0%).

Table 16. Descriptive statistics of user experience

User experience	Frequency	Percentage	Cumulative Percent
Smartphone brand			
1. iPhone	448	51.0	51.0
2. Huawei	191	21.7	72.7
3. MI	69	7.8	80.5
4. Samsung	52	5.9	86.5
5. Oppo	27	3.1	89.5
6. Meizu	20	2.3	91.8
7. Others_1	49	5.6	97.4
8. Others_2	23	2.6	100.0
Smartphone operation system			
1. iOS	452	51.4	51.4
2. Android	417	47.4	98.9
3. Windows OS	10	1.1	100.0
OTA used for hotel reservation			
1. Ctrip	490	55.7	55.7
2. Qunar	154	17.5	73.3
3. Alitrip	70	8.0	81.3
4. Tuniu	46	5.2	86.5
5. eLong	44	5.0	91.5
6. Lvmama	9	1.0	92.5
7. Mafengwo	5	0.6	93.1
8. CY	1	0.1	93.2
9. Others	60	6.8	100.0
Platform			
1. Mobile application (app)	724	82.4	82.4

2. Mobile website	155	17.6	100.0
Mobile payment time points			
1. Make hotel reservation	708	80.5	80.5
2. Check-in	130	14.8	95.3
3. Check-out	41	4.7	100
Mobile payment methods			
1. Alipay	666	75.8	75.8
2. WeChat Pay	162	18.4	94.2
3. Apple Pay	21	2.4	96.6
4. Others	30	3.4	100.0
Total	879	100.0	100.0

Note:

Others_1: Other smartphone models

Others_2: Respondents do not indicate their smartphone models

Table 17 reveals the main socio-demographic information of the 879 respondents. In terms of gender, males and females are relatively equally distributed. Males occupy 46.9% and females occupy 53.1%. All of these 879 respondents come from first-tier cities in China, of which 25.4% of them come from Beijing, 36.9% of them come from Shanghai, 23.7% of them come from Guangzhou, and 14.1% of them come from Shenzhen. In terms of the age group, 24.6% of the respondents are aged from 18 to 27; 49.0% of the respondents are aged from 28 to 37; 21.5% of the respondents are aged from 38 to 47; and only 4.0% of the respondents and 0.9% of the respondents are aged from 48 to 57, and from 58 or above, respectively. The statistics shows that the respondents tend to be the young generation. Referring to their monthly household income, 31.6% of the respondents have a monthly household income of RMB 15,000 or below, 38% of the respondents have a monthly income of RMB 15,001 to 25,000, 16.7% of the respondents have a monthly income of RMB 25,001 to 35,000, 6.6% of the respondents have

a monthly income of RMB 35,001 to 45,000, and 7.1% of the respondents have a monthly income of RMB 45,001 or above.

Table 17. Socio-demographic information of the respondents

Socio-demographic information	**Frequency**	**Percentage**	**Cumulative Percent**
Gender			
Male	412	46.9	46.9
Female	467	53.1	100.0
City			
Beijing	223	25.4	25.4
Shanghai	324	36.9	62.3
Guangzhou	208	23.7	86.0
Shenzhen	124	14.1	100.0
Age group			
18 - 27	216	24.6	24.6
28 - 37	431	49.0	73.6
38 - 47	189	21.5	95.1
48 - 57	35	4.0	99.1
58 or above	8	0.9	100.0
Monthly household income			
RMB 15,000 or below	278	31.6	31.6
RMB 15,001 to 25,000	334	38.0	69.6
RMB 25,001 to 35,000	147	16.7	86.3
RMB 35,001 to 45,000	58	6.6	92.9
RMB 45,001 or above	62	7.1	100.0
Total	879	100.0	100.0

5.3 Evaluation of hotel reservation information

Table 18 reveals the evaluation of hotel reservation information from seven aspects with 31 attributes. The statements are measured by Likert-scale, which ranges from 1 to 7, 1 refers to strongly disagree while 7 denotes strongly agree. For dimension A, “Hotel information”, the statement “It provides detailed hotel location information (1_A4).” has the highest mean value (m = 5.548) compared with other statements. On the contrary, the statement “It provides detailed information about hotel change policy (1_A8).” has the lowest mean value (m = 4.988) compared with other statements. Thus, OTAs should indicate the hotel change policy more clearly.

In terms of dimension B, “Communication information and promotion”, the statement “I can easily read the hotel reviews (1_B3).” has the highest mean value (m = 5.389). By contrast, the statement “I can easily see the request form (B2).” has the lowest mean value (m = 4.771) compared with other statements. The results reveal that customers can easily see the hotel reviews but it is not easy to find the request form on OTAs (i.e. mobile website, mobile app). Thus, OTAs should adjust the layout for customers to find the request form easily.

In reference to dimension C, “Transaction”, both statements measuring this dimension have relative higher mean values compared with that of other dimensions, indicating that it is easy (m = 5.430) and it is quick (m = 5.378) to book hotels via OTAs. For dimension D, “Interaction”, the mean values of the four attributes are quite consistent. The statement “It is easy to log in my membership account (1_D3).” has the highest mean value (m = 5.471) whereas “It is easy to share hotel-related information through social media (1_D4).” (m = 5.318) has the lowest mean value. The findings provide some implications for OTAs to improve the social network function, particularly for information sharing.

For the dimension E, “Layout design”, the statement “It provides a personalized search function (e.g. sort by price) (1_E1).” has the highest mean value (m = 5.326) whereas the statement “The overall speed of switching pages is fast (1_E2).” has the lowest mean value (m = 5.107). The finding indicates that OTAs should improve the speed of switching the pages when consumers search for hotel information. For dimension F, “Overall quality of information”, the mean values of these three attributes are quite consistent, indicating that the overall hotel information provided by OTAs is complete (m = 5.135), reliable (m = 5.119), and up to date (m = 5.072). When referring the overall customer satisfaction of the hotel information provided by OTAs, customers are satisfied in general, with a mean value of 5.157.

Table 18. Hotel reservation information

Hotel reservation information	Min	Max	Mean	Std. Deviation
A. Hotel information				
1_A1. It provides detailed hotel room types.	1.0	7.0	5.338	1.592
1_A2. Hotel room pictures are referential.	1.0	7.0	5.174	1.593
1_A3. Hotel room price is clearly displayed.	1.0	7.0	5.464	1.706
1_A4. It provides detailed hotel location information.	1.0	7.0	5.548	1.810
1_A5. It offers detailed hotel contact information.	1.0	7.0	5.476	1.818
1_A6. Hotel earliest check-in time information is clear.	1.0	7.0	5.297	1.757
1_A7. Hotel latest check-out time information is clear.	1.0	7.0	5.241	1.719
[1]1_A8. It provides detailed information about hotel change policy.	1.0	7.0	4.988	1.535
[2]1_A9. It provides detailed information about hotel cancellation policy.	1.0	7.0	5.130	1.551
B. Communication information and promotion				
[3]1_B1. I can easily see “24-hour customer service”.	1.0	7.0	4.849	1.518
[4]1_B2. I can easily see the request form.	1.0	7.0	4.771	1.588
[5]1_B3. I can easily read the hotel reviews.	1.0	7.0	5.389	1.506

[6]1_B4. I can easily see the hotel promotion information.	1.0	7.0	5.246	1.508
C. Transaction				
1_C1. It is quick to complete the hotel reservation.	1.0	7.0	5.378	1.668
1_C2. It is easy to complete the hotel reservation.	1.0	7.0	5.430	1.698
D. Interaction				
[7]1_D1. It is easy to post comments.	1.0	7.0	5.356	1.511
[8]1_D2. It is easy to give rating.	1.0	7.0	5.400	1.534
[9]1_D3. It is easy to log in my membership account.	1.0	7.0	5.471	1.501
[10]1_D4. It is easy to share hotel-related information through social media.	1.0	7.0	5.318	1.520
E. Layout design				
[11]1_E1. It provides a personalized search function (e.g. sort by price).	1.0	7.0	5.326	1.468
1_E2. The overall speed of switching pages is fast.	1.0	7.0	5.107	1.5793
1_E3. The layout of the hotel information is appropriate.	1.0	7.0	5.125	1.5923
1_E4. The interface is user-friendly.	1.0	7.0	5.117	1.5557
1_E5. Navigation is easy to follow.	1.0	7.0	5.158	1.5833
F. Overall quality of information				
1_F1. Reliable	1.0	7.0	5.119	1.5393
1_F2. Complete	1.0	7.0	5.135	1.5424
1_F3. Up to date	1.0	7.0	5.072	1.5723
G. Customer satisfaction				
1_G1. I am satisfied with the hotel information that is provided by OTA.	1.0	7.0	5.157	1.5071

Note:

1. n = 833, 2. n = 831, 3. n = 828, 4. n = 839, 5. n = 827, 6. n = 837, 7. n = 831, 8. n = 833, 9. n = 828, 10. n =828, 11. n = 827

5.4 Principle component analysis (PCA)

Principle component analysis is a popular and powerful multivariate data analysis method, which has been applied to many disciplines; and hospitality is not an exception (Bro & Smilde, 2014; Llodrà-Riera, Martínez-Ruiz, Jiménez-Zarco, & Izquierdo-Yusta, 2015; Papadimitriou, Kaplanidou, & Apostolopoulou, 2015). For example, to form an information source construct, Llodrà-Riera et al. (2015) reduced the attributes into three dimensions "information sources without Internet", "Web 1.0 platform", and "Web 2.0 platforms". For the present study, initially, principle component analysis was applied for dimensions, mobile functionality, mobile usability, attitude, subjective norms, and perceived behavioral control, respectively within the context of mobile payment for hotel reservations to find out the attributes that represent each dimension well.

5.4.1 PCA of hotel reservation information

Table 19 and Table 20 reveal the correlations of each pair of the attributes for hotel reservation information. The findings show that there is a high correction between each attribute ($p = 0.000$). The attributes are described as followings: 1_A1 = Room type; 1_A2 = Room picture; 1_A3 = Room price; 1_A4 = Hotel address; 1_A5 = Hotel contact information; 1_A6 = Hotel earliest check-in time; 1_A7 = Hotel latest check-out time; 1_A8 = Change policy (n = 833); 1_A9 = Cancellation policy (n = 831); 1_B1 = 24-hour customer service (n = 828); 1_B2 = Request form (n = 839); 1_B3 = Hotel reviews (n = 827); 1_B4 = Promotions (n= 837); 1_C1 = Quick to complete transaction; 1_C2 = Easy to complete transaction; 1_D1 = Post comments (n = 831), 1_D2 = Give rating (n = 833), 1_D3 = Login membership account (n = 828), 1_D4 = Share information on social media (n = 828), 1_E1 = Search function (n = 838), 1_E2 = Speed of

switching pages, 1_E3 = Layout, 1_E4 = Interface, and 1_E5 = Navigation. The coefficients of each pair of the aforementioned attributes are high.

Table 19. Correlations of the attributes of hotel reservation information_1

	1_A1	**1_A2**	**1_A3**	**1_A4**	**1_A5**	**1_A6**	**1_A7**	**1_A8**
1_A2	0.831***							
1_A3	0.838***	0.808***						
1_A4	0.823***	0.759***	0.877***					
1_A5	0.808***	0.767***	0.840***	0.902***				
1_A6	0.778***	0.746***	0.818***	0.829***	0.827***			
1_A7	0.766***	0.731***	0.798***	0.809***	0.799***	0.906***		
1_A8	0.639***	0.665***	0.613***	0.566***	0.588***	0.678***	0.698***	
1_A9	0.656***	0.663***	0.660***	0.612**	0.600***	0.714***	0.701***	0.859***

Note:

1_A1 = Room type; 1_A2 = Room picture; 1_A3 = Room price; 1_A4 = Hotel address; 1_A5 = Hotel contact information; 1_A6 = Hotel earliest check-in time; 1_A7 = Hotel latest check-out time; 1_A8 = Hotel change policy (n =833); 1_A9 = Hotel cancellation policy (n=831)

***Correlation is significant at the 0.01 level (2-tailed)*

**** Correlation is significant at the 0.001 level (2-tailed).*

Table 20. Correlations of the attributes of hotel reservation information_2

	1_B1	1_B2	1_B3	1_B4	1_C1	1_C2	1_D1	1_D2	1_D3	1_D4	1_E1	1_E2	1_E3	1_E4
1_B2	0.778***													
1_B3	0.653***	0.640***												
1_B4	0.656***	0.641***	0.750***											
1_C1	0.584***	0.559***	0.745***	0.698***										
1_C2	0.552***	0.554***	0.747***	0.698***	0.934***									
1_D1	0.554**	0.569**	0.777**	0.719**	0.800**	0.807***								
1_D2	0.548**	0.558**	0.769**	0.702**	0.809**	0.802***	0.911**							
1_D3	0.507**	0.518**	0.754**	0.694**	0.808**	0.810***	0.844**	0.837**						
1_D4	0.595**	0.569**	0.725**	0.704**	0.762**	0.753***	0.794**	0.791**	0.791**					
1_E1	0.587**	0.576**	0.728**	0.730**	0.784**	0.778***	0.805**	0.802**	0.774**	0.779**				
1_E2	0.604**	0.621**	0.706**	0.719**	0.816**	0.813***	0.758**	0.746**	0.739**	0.725**	0.806**			
1_E3	0.609**	0.609**	0.717**	0.721**	0.794**	0.799***	0.727**	0.724**	0.740**	0.713**	0.785**	0.877**		
1_E4	0.619**	0.625**	0.713**	0.721**	0.801**	0.802***	0.729**	0.720**	0.734**	0.732**	0.801**	0.883**	0.913**	
1_E5	0.609**	0.612**	0.717**	0.737**	0.800**	0.825***	0.747**	0.745**	0.749**	0.740**	0.814**	0.896**	0.900**	0.914**

Note:

1_B1 = 24-hour service (n=828); 1_B2 = Request form (n=839); 1_B3 = Hotel reviews (n=827); 1_B4 = Hotel promotion (n=837); 1_C1 = Quick to complete transaction; 1_C2 = Easy to complete transaction; 1_D1 = Post comments (n=831), 1_D2 = Give rating (n=833), 1_D3 = Login membership account (n=828), 1_D4 = Share information on social media (n=828), 1_E1 = Search function (n=838), 1_E2 = Speed of switching pages, 1_E3 = Layout, 1_E4 = Interface, and 1_E5 = Navigation.

***Correlation is significant at the 0.01 level (2-tailed).*

****Correlation is significant at the 0.001 level (2-tailed).*

Since there is a high coefficient value between each compare of the attributes related to hotel reservation information, principal component analysis was conducted. The scree plot of hotel reservation information (Figure 14) shows that the appropriate component is four. Thus, the extraction method “Fixed number of factors (4)” was selected.

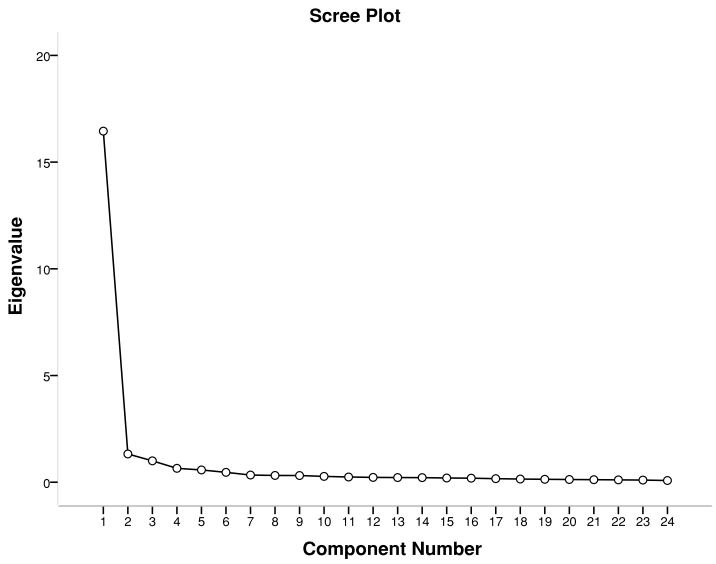


Figure 14. Scree plot of hotel reservation information

Table 21 indicates the communalities of each attribute involved in hotel reservation information. The value of communalities of each attribute is relatively consistent and high, which ranges from 0.698 to 0.886.

Table 21. Communalities of hotel reservation information

Attributes	Initial	Communalities
1_A1. Room type	1.000	0.736
1_A2. Room picture	1.000	0.698
1_A3. Room price	1.000	0.806
1_A4. Hotel address	1.000	0.851
1_A5. Hotel contact information	1.000	0.785
1_A6. Earliest check-in time	1.000	0.816
1_A7. Latest check-out time	1.000	0.790
1_A8. Change policy	1.000	0.800
1_A9. Cancellation policy	1.000	0.768
1_B1. 24-hour service	1.000	0.816
1_B2. Request form	1.000	0.819
1_B3. Hotel reviews	1.000	0.775
1_B4. Hotel promotion	1.000	0.736
1_C1. Quick to complete transaction	1.000	0.839
1_C2. Easy to complete transaction	1.000	0.840
1_D1. Post comments	1.000	0.854
1_D2. Give rating	1.000	0.845
1_D3. Login membership account	1.000	0.823
1_D4. Share information on social media	1.000	0.757
1_E1. Search function	1.000	0.800
1_E2. Speed of switching pages	1.000	0.843
1_E3. Layout	1.000	0.864
1_E4. Interface	1.000	0.886
1_E5. Navigation	1.000	0.884

After the extraction with four fixed number and rotated with Varimax with Kaiser Normalization, the four possible components, with coefficients greater than 0.5 are listed below (Table 22). Factor 1 is named as "*Hotel information*", which includes seven attributes, that is, "hotel earliest check-in time", "hotel contact information", "hotel room price", "hotel latest check-out time", "hotel location information", 'hotel room types", and "hotel room pictures". It explains 25.053% of the total variance. Factor 2 is considered as "*Communication and interaction*", which includes eight attributes, that is, "easy to give rating", "easy to post comments", "login membership account", "quick to complete transaction", "easy to complete transaction", "easy to share hotel information", "easy to read hotel reviews", and "easy to see the hotel promotion information". It explains 21.979% of the total variance. Factor 3 was recognized as "*Design and layout*", which contains five attributes. That is, "interface is user-friendly", "navigation is easy to follow", "layout is appropriate", "speed of switching pages is fast", and "personalized search function is provided". It explains 18.221% of the total variance. The last component, factor 4 is reflected as "*Consumer requests*", which includes four attributes: "easy to find the request form", "provide 24-hour customer service", "provide information about hotel change policy", and "provide information about hotel cancellation policy". It explains 15.709% of the total variance.

The reliability test was further conducted for each component. Cronbach's alpha of factor 1 "*Hotel information*" is 0.968, Cronbach's alpha of factor 2 "*Communication and interaction*" is 0.963, Cronbach's alpha of factor 3 "*Design and layout*" is 0.962, and Cronbach's alpha of factor 4 "*Consumer requests*" is 0.898. The results show that the attributes included in each dimension are reliable in representing factor 1, 2, 3, and 4, respectively.

The study of Wang (2008) divided hotel information into four levels, that is, information level, communication level, transaction level, and relationship level. The findings of the present study reveal that the hotel information presented on smartphones can be categorized into four aspects, that is, hotel information, communication and interaction, design and layout, and consumer requests. The comments of respondents reflect that the layout of mobile websites is poor. In addition, the font size is too small, and cannot be adjusted. By contrast, the performance of apps is better than that of mobile websites. The results provide some implications for hotel managers to communicate with OTAs to improve the layout of mobile websites for hotel reservations.

Table 22. PCA of hotel reservation information

Dimensions	**Factor loadings**			
Hotel information	**1**	**2**	**3**	**4**
1_A6. Hotel earliest check-in time information is clear.	0.761			
1_A5. It offers detailed hotel contact information.	0.746			
1_A3. Hotel room price is clearly displayed.	0.741			
1_A7. Hotel latest check-out time information is clear.	0.740			
1_A4. It provides detailed hotel location information.	0.732			
1_A1. It provides detailed hotel room types.	0.652			
1_A2. Hotel room pictures are referential.	0.605			
Communication and interaction				
1_D2. It is easy to give rating.		0.700		
1_D1. It is easy to post comments.		0.695		
1_D3. It is easy to log in my membership account.		0.680		
1_C1. It is quick to complete the hotel reservation.		0.655		
1_C2. It is easy to complete the hotel reservation.		0.640		

1_D4. It is easy to share hotel-related information through social media.		0.637		
1_B3. I can easily read the hotel reviews.		0.597		
1_B4. I can easily see the hotel promotion information.		0.548		
Design and layout				
1_E4. The interface is user-friendly.			0.755	
1_E5. Navigation is easy to follow.			0.742	
1_E3. The layout of the hotel information is appropriate.			0.741	
1_E2. The overall speed of switching pages is fast.			0.709	
1_E1. It provides a personalized search function (e.g. sort by price).			0.551	
Customer requests				
1_B2. I can easily see the request form.				0.807
1_B1. I can easily see “24-hour customer service”.				0.795
1_A8. It provides detailed information about hotel change policy.				0.624
1_A9. It provides detailed information about hotel cancellation policy.				0.561
% of variance explained	25.053	21.979	18.221	15.709
Total variance explained	80.692			
Cronbach’s alpha	0.968	0.963	0.962	0.898

Note:

Extraction method: Principal Component Analysis.

Rotation method: Varimax with Kaiser Normalization.

Rotation converged in 9 iterations.

5.4.2 PCA of mobile payment components

Table 23 indicates the correlations of each pair of the attributes of mobile payment components. Since in general, the finding shows that the correlation between each pair of the attributes of mobile payment components is high, principal component analysis was further conducted. The attributes are: 1_A1 = Mobile payment method; 2_A2 = Mobile payment flow; 2_B2 = Compatibility; 2_B3 = Payment notification; 2_B4 = Convenience; 2_B5 = Quick; 2_B6 = Safe; 2_C1 = Good; 2_C2 = Fun, 2_C3 = Enjoyable; 2_C4 = Pleasant; 2_D1 = Most people use mobile payment; 2_D2 = Wish me to use mobile payment; 2_D3 = Support me to use mobile payment; 2_D4 = If most people use mobile payment, I will use; 2_E1 = Confident; 2_E2 = Not beyond my control. Although 2_A1 and 2_A2 have a high correlation (coefficient = 0.852) between each other, the correlations between these two attributes and other attributes are not high, although they are still significant at 0.01 level.

Table 23. Correlations of mobile payment components

	2_A1	**2_A2**	**2_B2**	**2_B3**	**2_B4**	**2_B5**
2_A2	0.852**					
2_B2	0.382**	0.348**				
2_B3	0.368**	0.349**	0.928**			
2_B4	0.365**	0.331**	0.927**	0.939**		
2_B5	0.373**	0.343**	0.933**	0.931**	0.954**	
2_B6	0.331**	0.340**	0.808**	0.808**	0.797**	0.799**

Note:

2_A1 = Mobile payment method; 2_A2 = Mobile payment flow; 2_B2 = Compatibility; 2_B3 = Payment notification; 2_B4 = Convenience; 2_B5 = Quick; 2_B6 = Safe.

***Correlation is significant at the 0.01 level (2-tailed).*

Table 24 indicates the communalities of each attribute involved in mobile payment components, and the value of each attribute is relatively consistent and high.

Table 24. Communalities of mobile payment components (PCA)

Attributes of mobile payment components	**Initial**	**Communalities**
2_A1. Hotel payment information	1.000	0.925
2_A2. Payment flow	1.000	0.927
2_B2. Compatibility	1.000	0.934
2_B3. Payment notification	1.000	0.939
2_B4. Payment convenient	1.000	0.944
2_B5. Payment quick	1.000	0.944
2_B6. Payment safe	1.000	0.775

The scree plot of mobile components shows that the appropriate component is two (Figure 15). Thus, the extraction method "Fixed number of factors (2)" was selected to conduct principal component analysis.

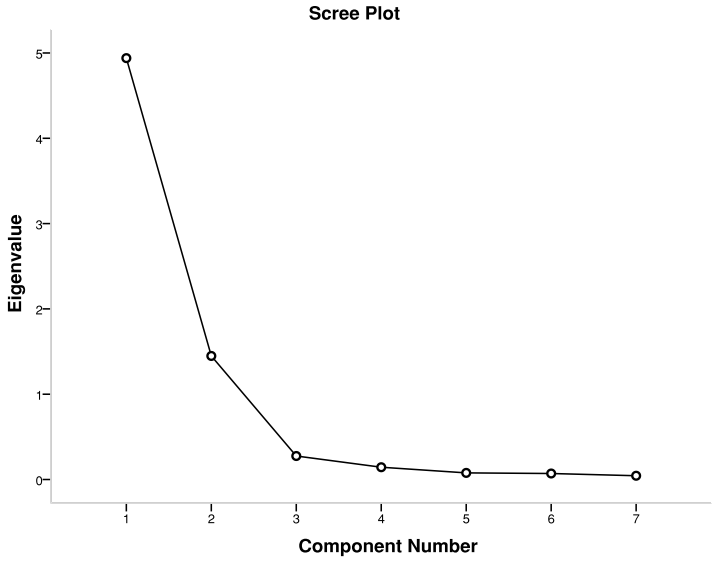


Figure 15. Scree plot of mobile payment components (PCA)

After the extraction with two fixed number and rotated with Varimax with Kaiser Normalization, the two possible components, with the coefficients greater than 0.5 are indicated below (Table 25). Factor 1 is named as "*Functionality toward mobile payment*", which includes two attributes, "payment flow", and "mobile payment information". It explains 27.938% of the total variance. Factor 2 is named as "*Usability toward mobile payment*", which includes five attributes, that is, "payment convenient", "payment quick", "in-time payment notification", "compatibility", "payment safe". It explains 63.322% of the total variance. The total variance explained is 91.260. The reliability test was further conducted for each component. Cronbach's alpha of factor 1 "*Functionality toward mobile payment*" is 0.920, and Cronbach's alpha of factor 2 "*Usability toward mobile payment*" is 0.974. The results show that the attributes included in each component are reliable in representing factor 1 and factor 2, respectively.

The finding of the present study indicates that payment flow and payment information are two attributes that can be used to measure mobile functionality within the context of mobile payment for hotel reservations. The finding of Oliveira et al. (2016) indicated that compatibility and perceived technology security are important attributes to measure mobile usability. The finding of Schierz et al. (2010) further revealed that compatibility and the convenience of mobile payment can be used to measure mobile usability. The results of the present study prove the findings of the previous studies (Oliveira et al., 2016; Schierz et al., 2010) and found two more attributes to measure mobile usability within the context of mobile payment for hotel reservations. That is, the speed of mobile payment, and mobile payment notification.

Table 25. PCA of mobile payment components

Dimensions and attributes	Factor loadings	
Functionality toward mobile payment	**1**	**2**
2_A2. Payment flow	0.947	
2_A1. Mobile payment information	0.940	
Usability toward mobile payment		
2_B4. Payment convenient		0.955
2_B5. Payment quick		0.953
2_B3. In-time payment notification		0.950
2_B2. Compatibility		0.946
2_B6. Payment safe		0.861
% of variance explained	27.938	63.322
Total variance explained	91.260	
Cronbach's alpha	0.920	0.974

Note:

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 3 iterations.

5.4.3 PCA of TPB components

Since the correlations between each pair of the attributes of TPB components are high (Table 26), principal component analysis was further conducted. Table 27 indicates the communalities of each attribute of TPB components, and the value of each attribute to represent TPB components is relatively consistent and high.

Table 26. Correlations of TPB components

	2_C1	**2_C2**	**2_C3**	**2_C4**	**2_D1**	**2_D2**	**2_D3**	**2_D4**	**2_E1**
2_C2	0.812**								
2_C3	0.822**	0.927**							
2_C4	0.845**	0.884**	0.908**						
2_D1	0.837**	0.758**	0.770**	0.782**					
2_D2	0.807**	0.773**	0.778**	0.763**	0.865**				
2_D3	0.841**	0.778**	0.793**	0.798**	0.891**	0.904**			
2_D4	0.890**	0.788**	0.794**	0.807**	0.877**	0.846**	0.882**		
2_E1	0.896**	0.801**	0.815**	0.813**	0.840**	0.776**	0.827**	0.855**	
2_E2	0.812**	0.790**	0.804**	0.813**	0.851**	0.783**	0.836**	0.847**	0.928**

Note:

2_C1 = Good; 2_C2 = Fun, 2_C3 = Enjoyable; 2_C4 = Pleasant; 2_D1 = Most people use mobile payment; 2_D2 = Wish me to use mobile payment; 2_D3 = Support me to use mobile payment; 2_D4 = If most people use, I will use; 2_E1 = Confident; 2_E2 = Not beyond my control

***Correlation is significant at the 0.01 level (2-tailed).*

Table 27. Communalities of TPB components (PCA)

Attributes	Initial	Communalities
2_C1. Good	1.000	0.922
2_C2. Fun	1.000	0.942
2_C3. Enjoyable	1.000	0.954
2_C4. Pleasant	1.000	0.919
2_D1. Use mobile payment	1.000	0.913
2_D2. Wish me	1.000	0.942
2_D3. Support me	1.000	0.936
2_D4. If they use, I use.	1.000	0.891
2_E1. Confident	1.000	0.938
2_E2. Not beyond my control	1.000	0.942

The scree plot of TPB components reveals that the appropriate component is three (Figure 16). Thus, the extraction method "Fixed number of factors (3)" was selected to conduct principal component analysis.

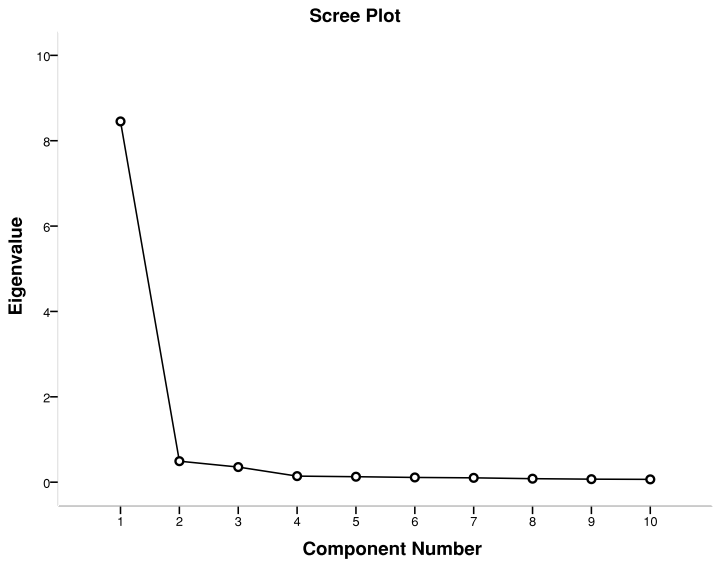


Figure 16. Scree plot of TPB components (PCA)

After the extraction rotated with three fixed number of components with Varimax with Kaiser Normalization, the three possible components, with coefficients greater than 0.5 are indicated below (Table 28). Factor 1 is known as "*Attitude*". That is, "fun", "enjoyable", and "pleasant". It explains 31.132% of the total variance. Factor 2 was recognized as "*Subjective norms*", which contains four attributes. That is, "Most people in my social network wish me to use mobile payment for hotel reservations.", "Most people in my social network support me to use mobile payment for hotel reservations.", "Most people in my social network use mobile payment for hotel reservations.", and "If most people use mobile payment for hotel reservations, I will use." Factor 2 explains 32.214% of the total variance. The last component, factor 3 is considered as "*Perceived behavioral control*", which includes three attributes: "Mobile payment for hotel reservations is not belong my control.", "I am confident in using mobile payment for hotel reservations.", and "Mobile payment for hotel reservations is good.". It explains 29.642% of the total variance. The reliability test was further conducted for each component. Cronbach's alpha of factor 1"*Attitude*" is 0.967, Cronbach's alpha of factor 2 "*Subjective norms*" is 0.966, Cronbach's alpha of factor 3 "*Perceived behavioral control*" is 0.966. The results reflect that the attributes included in each component are reliable in representing factor 1, factor 2, and factor 3, respectively.

The findings of the present study are matched with that of previous studies and the recent studies to a large extent (Hsu & Huang, 2012; Park & Huang, 2017), except one attribute "good", which is normally regarded as a measurement of attitude in previous studies. In the context of mobile payment for hotel reservations, "good" is an attribute to reflect the perceived behavioral control better based on the principal component analysis.

Table 28. PCA of TPB components

Dimensions and attributes	Factor loadings		
Attitude	**1**	**2**	**3**
2_C2. Fun	0.810		
2_C3. Enjoyable	0.806		
2_C4. Pleasant	0.757		
Subjective norms		0.821	
2_D2. Wish me		0.770	
2_D3. Support me		0.715	
2_D1. Use mobile payment		0.661	
2_D4. If they use, I use.			
Perceived behavioral control			
2_E2. Not beyond my control			0.756
2_E1. Confident			0.750
2_C1. Good			0.723
% of variance explained	31.132	32.214	29.642
Total variance explained	92.987		
Cronbach's alpha	0.967	0.966	0.966

Note:

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 7 iterations.

5.4.4 PCA of customer satisfaction

Table 29 indicates the communalities of each attribute of customer satisfaction, and the value of each attribute representing customer satisfaction is relatively consistent and high.

Table 29. Communalities of customer satisfaction (PCA)

Attributes	**Initial**	**Communalities**
2_F1. Satisfied with mobile payment experience	1.000	0.862
2_F2. A wise decision to use mobile payment	1.000	0.862

After extraction with principal component analysis, total variance explained is equal to 86.160, and the factor loadings of "satisfaction" and "a wise decision" are 0.928, respectively. The reliability test was further conducted. The value of Cronbach's alpha of these two attributes is 0.839, indicating that these two attributes represent the dimension customer satisfaction well within the context of mobile payment for hotel reservations. The finding is similar to the that of the study of Bai et al. (2008), although the recent study found that value for money is an important measurement to measure customer satisfaction (Rahimi & Kozak, 2017). The two attributes to measure customer satisfaction are "My choice of using mobile payment to make hotel reservation is a wise one." and "I am satisfied with mobile payment experience for my most recent hotel reservation."

5.4.5 PCA of repurchase intention

Table 30 indicates the communalities of each attribute of repurchase intention, and the value of each attribute to represent repurchase intention is relatively consistent and high.

Table 30. Communalities of repurchase intention (PCA)

Attributes	**Initial**	**Communalities**
2_G1. Mobile website_OTA_next 12 months	1.000	0.804
2_G2. Mobile app_OTA_next 12 months	1.000	0.804

After extraction with principal component analysis, total variance explained is equal to 80.381. The factor loadings of these two attributes are 0.897, respectively. The reliability test was further conducted. Cronbach's alpha of these two attributes is 0.755, indicating that these two attributes represent repurchase intention well, although the study of Su et al. (2016, p. 88) adopted three attributes "I intend to revisit (hotel name) my next trip to this area.", "(Hotel name) would always be my first choice.", and "I would like to come back to (hotel name) in the future." to measure repurchase intention. Nevertheless, these three attributes are too vague in the aspect of time limit, which may affect the possibility of actual purchase behavior of consumers. Thus, the present study added the time limit of the statements; and the two attributes that the present study adopts are "I will make hotel reservation(s) using mobile payment through the mobile websites of OTA(s) in the next 12 months." "I will make hotel reservations using mobile payment through mobile APP(s) of OTA(s) in the next 12 months."

5.5 Exploratory factor analysis (EFA)

After conducting the initial principle component analysis, exploratory factor analysis was adopted to further verify the underlying dimensions (Papadimitriou et al., 2015). In other words, the items that can be retained under the number of factors should be identified (Aljahwari, Sirakaya-Turk, Altintas, Okumus, & Okumus, 2016). In the present study, exploratory factor analysis was conducted for mobile payment components, TPB components, customer satisfaction, and repurchase intention for hotel reservations.

5.5.1 EFA of mobile payment for hotel reservations

Table 31 indicates the communalities of each attribute of mobile payment for hotel reservations, and the value of each attribute representing mobile payment for hotel reservations is relatively consistent and high. In addition, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is equal to 0.871. Bartlett's Test of Sphericity indicates that Chi-Square value is equal to 8,387.709, df = 21, and the p value is 0.000.

Table 31. Communalities of mobile payment components (EFA)

Attributes	**Initial**	**Communalities**
2_A1. Hotel payment information	0.737	0.850
2_A2. Payment flow	0.733	0.854
2_B2. Compatibility	0.903	0.925
2_B3. Payment notification	0.911	0.933
2_B4. Payment convenient	0.932	0.942
2_B5. Payment quick	0.930	0.942
2_B6. Payment safe	0.686	0.690

The scree plot of mobile for hotel reservations (Figure 17) shows that the appropriate component is two. Thus, the extraction method “Fixed number of factors (2)” was selected to conduct exploratory factor analysis.

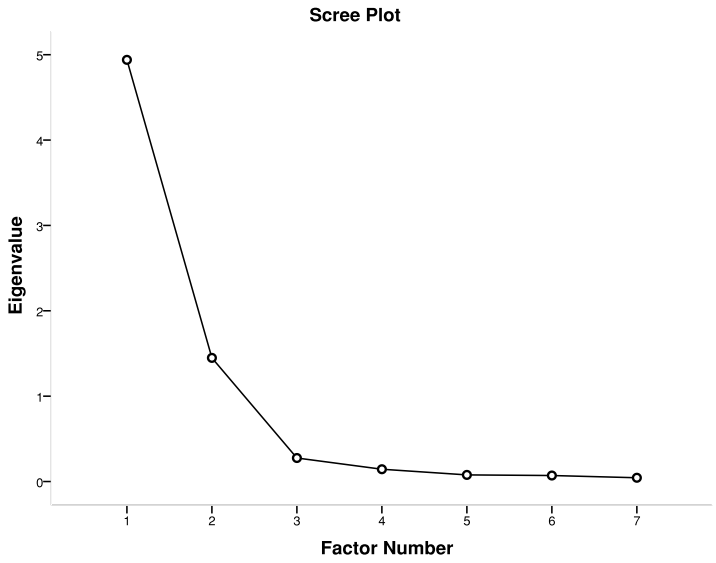


Figure 17. Scree plot of mobile payment components (EFA)

After the extraction with Principal Axis Factoring and rotated with Promax with Kaiser Normalization, the two possible components, with the coefficients greater than 0.5, are indicated below (Table 32). Factor 1 is named as "*Functionality toward mobile payment*", which includes two attributes, that is, "payment flow", and "hotel payment information". It explains 34.629% of the total variance. The results revealed that different from functionality of hotel reservation such as hotel room information and location information (Adukaite et al., 2014; Anuar et al., 2014), functionality toward mobile payment involves information of payment flow and payment information. Cronbach's alpha of factor 1 "*Functionality toward mobile payment*" is 0.920. Factor 2 is named as "*Usability toward mobile payment*", which includes five attributes, that is, "payment convenient", "payment quick", "in-time payment notification", "compatibility", and "payment safe". It explains 67.286% of the total variance. The reliability test was further conducted. Cronbach's alpha of factor 2 is 0.974. Total variance explained is equal to 87.667. The findings show that compared with the measurements of previous studies (Hahn et al., 2017; Liébana-Cabanillas et al., 2017), "in-time payment notification" and "payment quick" are the

unique attributes to measure usability toward mobile payment for hotel reservations. The results of Cronbach's alpha show that the attributes included in each dimension are reliable in representing factor 1 and factor 2. The findings of EFA of mobile payment for hotel reservations confirm that of PCA of mobile payment components. In other words, it is further verified that "payment flow" and "hotel payment information" are two attributes to represent functionality toward mobile payment whereas five attributes, "payment convenient", "payment quick", "in-time payment notification", "compatibility", and "payment safe" can be used to represent usability toward mobile payment.

Table 32. EFA of mobile payment components

Dimensions and attributes	**Factor loadings**	
Functionality toward mobile payment	**1**	**2**
2_A2. Payment flow	0.929	
2_A1. Hotel payment information	0.914	
Usability toward mobile payment		
2_B4. Payment convenient		0.978
2_B5. Payment quick		0.973
2_B3. Payment notification		0.967
2_B2. Compatibility		0.959
2_B6. Payment safe		0.817
% of variance explained	34.629	67.286
Total variance explained	87.667	
Cronbach's alpha	0.920	0.974

Note:

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

Rotation converged in 3 iterations.

5.5.2 EFA of TPB components of mobile payment for hotel reservations

Table 33 indicates the communalities of each attribute, and the value of each attribute to represent TPB components is relatively consistent and high. In addition, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is equal to 0.950. Bartlett's Test of Sphericity indicates that Chi-Square value is equal to 13,958.165, df = 45, and the p value is 0.000. The scree plot of TPB components (Figure 18) displays that the appropriate component is three. Thus, the extraction method "Fixed number of factors (3)" was selected to conduct exploratory factor analysis for TPB components.

Table 33. Communalities of TPB components (EFA)

Attributes	**Initial**	**Communalities**
2_C1. Good	0.863	0.883
2_C2. Fun	0.875	0.904
2_C3. Enjoyable	0.899	0.948
2_C4. Pleasant	0.863	0.878
2_D1. Use mobile payment	0.861	0.883
2_D2. Wish me	0.848	0.891
2_D3. Support me	0.885	0.922
2_D4. If they use, I use.	0.852	0.865
2_E1. Confident	0.890	0.915
2_E2. not beyond my control	0.893	0.925

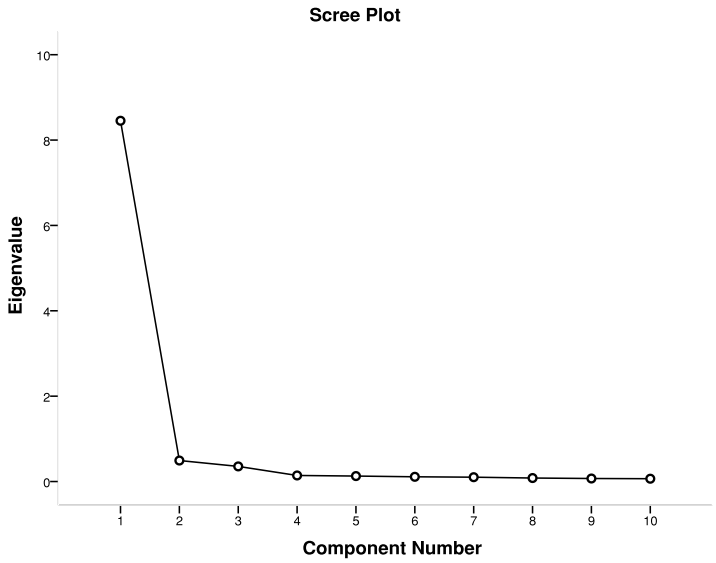


Figure 18. Scree plot of TPB components (EFA)

After the extraction rotated with three fixed number of components with Principal Axis Factoring, the three possible components, with coefficients greater than 0.5 are indicated below (Table 34). Factor 1 is known as "*Attitude*". That is, "fun", "enjoyable", and "pleasant". It explains 71.000% of the total variance. Factor 2 is recognized as "*Subjective norms*", which contains four attributes. That is, "Most people in my social network wish me to use mobile payment for hotel reservations.", "Most people in my social network support me to use mobile payment for hotel reservations.", "Most people use mobile payment for hotel reservation.", and "If most people use mobile payment for hotel reservations, I will use.". It explains 73.725% of the total variance. The last factor, factor 3 is considered as "*Perceived behavioral control*", which includes three attributes: "not beyond my control", "confident", and "good". It explains 74.180% of the total variance. The reliability test was further conducted for each component. Cronbach's alpha of factor 1 "*Subjective norms*" is 0.967, Cronbach's alpha of factor 2 "*Attitude*" is 0.966, Cronbach's alpha of factor 3 "*Perceived behavioral control*" is 0.966. Total variance explained is 90.138. The results show that the attributes included in each component are reliable in

representing factor 1, factor 2, and factor 3, respectively. Although in most of the previous studies, the attribute "good" is an attribute to measure attitude (Chan, Okumus, & Chan, 2017; Fong et al., 2017; Hsu & Huang, 2012), within the context of mobile payment for hotel reservations, it reflects the dimension perceived behavioral control better.

The findings of EFA of TPB components of mobile payment for hotel reservations also confirm that of PCA of TPB components. The findings are matched with a majority of literature relating to the measurements of TPB components. Within the context of mobile payment for hotel reservation, the only difference is "good" is used to represent perceived behavioral control although it is normally used to represent attitude in previous studies.

Table 34. EFA of TPB components

Dimensions and attributes	Factor loadings		
Attitude	**1**	**2**	**3**
2_C3. Enjoyable	0.892		
2_C2. Fun	0.846		
2_C4. Pleasant	0.705		
Subjective norms			
2_D2. Wish me		0.900	
2_D3. Support me		0.820	
2_D1. Use mobile payment		0.662	
2_D4. If they use, I use.		0.547	
Perceived behavioral control			
2_E2. not beyond my control			0.826
2_E1. Confident			0.802
2_C1. Good			0.701
% of variance explained	71.000	73.725	74.180
Total variance explained	90.138		
Cronbach's alpha	0.967	0.966	0.966

Note:

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

Rotation converged in 7 iterations.

5.5.3 EFA of customer satisfaction

In terms of the communalities of each attribute of customer satisfaction of mobile payment for hotel reservations, the value of each attribute to represent customer satisfaction is relatively consistent and high. By extraction through Principal Axis Factoring, initials of both "satisfaction" and "wise decision" are equal to 0.523; whereas the communalities of them are equal to 0.722. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is equal to 0.500. Bartlett's Test of Sphericity indicates that Chi-Square is equal to 648.863, df = 1, and the p value is 0.000. Total variance explained is 86.160. Factor loadings of these two attributes to measure customer satisfaction are equal to 0.850; and Cronbach's alpha of these two attributes is equal to 0.839. The above indicators show that the two attributes represent the dimension customer satisfaction well, although the finding of the recent study indicated that value for money is an important measurement for customer satisfaction of hotel reservation (Rahimi & Kozak, 2017). The two attributes to measure customer satisfaction in the present study are: "My choice of using mobile payment to make hotel reservation is a wise one." and "I am satisfied with mobile payment experience for my most recent hotel reservation."

5.5.4 EFA of repurchase intention

In reference to the communalities of each attribute of repurchase intention of hotels via mobile payment, the value of each attribute is relatively consistent and high after extraction through Principal Axis Factoring. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is equal to 0.500. Bartlett's Test of Sphericity indicates that Chi-Square is equal to 403.851, df = 1, and the p value is 0.000. Initials of both attributes are 0.369, and the communalities are 0.607. Total variance explained is equal to 60.668. Factor loadings of these two attributes are equal to 0.779 respectively. Cronbach's alpha of these two attributes is 0.755. The above indicators reveal

that these two attributes represent repurchase intention of hotels via mobile payment well. Two attributes that are used to measure repurchase intention are: “I will make hotel reservation(s) using mobile payment through the mobile website(s) of OTA(s) in the next 12 months.” and “I will make hotel reservation(s) using mobile payment through mobile APP(s) of OTA(s) in the next 12 months.” The findings of EFA of repurchase intention of hotels via mobile payment confirm that of PCA of repurchase intention. Previous studies mainly used two to three measurements to measure repurchase intention (Bai et al., 2008; Han et al., 2010; Mao & Lyu, 2017). For example, Bai et al. (2008) adopted two measurements and asked respondents about the likelihood of further purchase from travel websites considering both short-term intention and long-term intention. Some studies used three measurements to measure the willingness, plan and an effort to choose a certain type of hotel or use hotel reservation platform without the consideration of time frame (Han et al., 2010; Mao & Lyu, 2017). The finding of the present study indicates that measurements considering the likelihood of future hotel repurchase intention using mobile payment within the next 12 months can represent the dimension repurchase intention of hotel via mobile payment well.

5.6 Structural equation modeling (SEM)

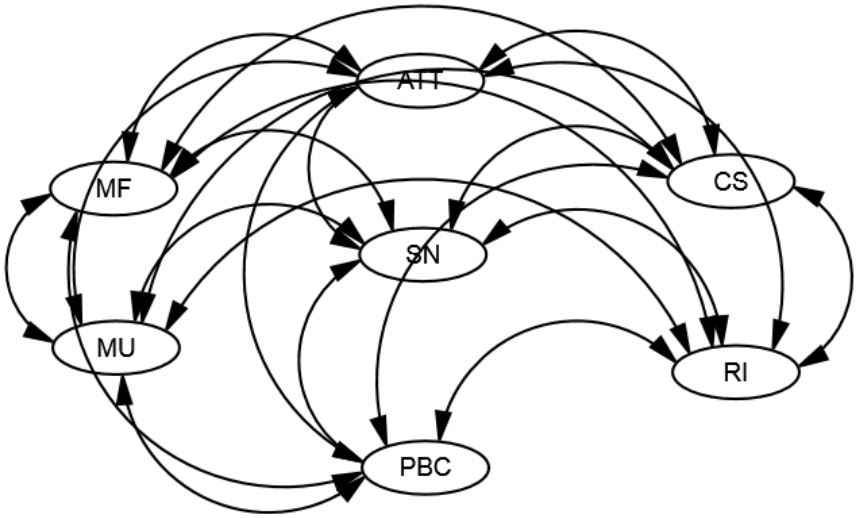
Structural equation modeling mainly includes confirmatory factor analysis and path analysis. The purpose of confirmatory factor analysis is to examine the overall fitness of the model (Papadimitriou et al., 2015). Indicators such as chi-square statistic (χ^2), comparative fit index (CFI), incremental fit index (IFI), and root mean square error of approximation can be used to measure the fitness of the model (Hu & Bentler, 1996). SPSS Amos 23 package was used to test the overall fitness of the proposed conceptual framework through structural equation modeling.

On the other hand, validity and reliability of each construct involved in the proposed research framework are examined. There are two types of validity, one is convergent validity and another is discriminant validity. Convergent validity refers to the degree of the same concept by two or more attempts through maximally dissimilar methods (Bagozzi, 1981). In other words, to measure convergent validity, at least two measures with at least two procedures have to be achieved. Hair, Black, Babin, Anderson, and Tatham (2006) further explained that convergent validity means that a good percentage of variance is shared. On the other hand, the rule of measuring discriminant validity is to check whether the squared correlation between two constructs is less than the average variance extracted from each construct (Fornell & Larcker, 1981b). After checking the validity and reliability of each construct, structural relationships of different dimensions can be estimated through examining the group differences on a model level. Furthermore, path coefficients provided by path analysis are regarded as valid indicators to test whether the hypotheses are supported or not (Kline, 2015).

In the present study, discriminant validity of seven constructs, mobile functionality, mobile usability, attitude, subjective norms, perceived behavioral control, customer satisfaction, and repurchase intention are examined by calculating the average variance extracted (AVE) of each dimension, and then AVE is used to compare with squared correlation of each dimension. If AVE is greater than the squared correlation of each dimension (Fornell & Larcker, 1981a), then discriminant validity can be achieved. Furthermore, if AVE of each dimension is greater than 0.50, the convergent validity can be confirmed (Khan & Rahman, 2017).

5.7 Confirmatory factor analysis (CFA)

Figure 19 shows the relationships among seven different dimensions. In total, there are 21 correlations between each construct within the context of mobile payment for hotel reservations. That is, between mobile functionality and mobile usability, between mobile functionality and attitude, between mobile functionality and subjective norms, between mobile functionality and perceived behavioral control, between mobile functionality and customer satisfaction, between mobile functionality and repurchase intention, between mobile usability and attitude, between mobile usability and subjective norms, between mobile usability and perceived behavioral control, between mobile usability and customer satisfaction, between mobile usability and repurchase intention, between attitude and subjective norms, between attitude and perceived behavioral control, between subjective norms and perceived behavioral control, between attitude and customer satisfaction, between attitude and repurchase intention, between subjective norms and customer satisfaction, between subjective norms and repurchase intention, between perceived behavioral control and customer satisfaction, between perceived behavioral control and repurchase intention, and between customer satisfaction and repurchase intention within the context of mobile payment for hotel reservations. Table 35 indicates the unstandardized regression weights and standardized regression weights of attributes that represent each dimension in the proposed research framework. The findings reveal that each attribute under each dimension of the proposed research framework can represent each dimension well.



Note:

MF = mobile functionality; MU = mobile usability; CS = customer satisfaction; ATT = attitude; SN = subjective norms; PBC = perceived behavioral control; RI = repurchase intention

Figure 19. Covariance of each dimension

Table 35. Unstandardized regression weights vs. standardized regression weights

Dimensisons and attributes			Unstandardized regression weights	Standardized regression weights
MF	→	**mf1**	0.972	0.893
MF	→	**mf2**	1.000	0.954
MU	→	**mu1**	0.999	0.972
MU	→	**mu2**	1.000	0.973
MU	→	**mu3**	0.980	0.963
MU	→	**mu4**	0.964	0.960
MU	→	**mu5**	0.811	0.835
SN	→	**sn1**	0.967	0.921
SN	→	**sn2**	0.991	0.953
SN	→	**sn3**	1.000	0.939
SN	→	**sn4**	1.007	0.935
ATT	→	**att1**	1.037	0.968
ATT	→	**att2**	1.000	0.951
ATT	→	**att3**	1.008	0.940
PBC	→	**pbc1**	1.031	0.959
PBC	→	**pbc2**	1.000	0.949
PBC	→	**pbc3**	1.014	0.947
CS	→	**cs1**	1.255	0.756
CS	→	**cs2**	1.258	0.956
RI	→	**ri1**	1.000	0.645
RI	→	**ri2**	1.360	0.942

Note:

MF = mobile functionality; MU = mobile usability; ATT = attitude; SN = subjective norms; PBC = perceived behavioral control; CS = customer satisfaction; RI = repurchase intention; mf1 = mobile payment flow; mf2 = mobile payment information; mu1 = convenience; mu2 = quickness; mu3 = in-time notification; mu4 = compatibility; mu5 = safety; att1 = enjoyable; att2 = fun; att3 = pleasant; sn1 = wish me; sn2 = support me; sn3 = most people use; sn4 = if they use, I use; pbc 1 = not beyond my control; pbc 2 = confident; pbc 3 = good; cs1 = a wise decision; cs2 = satisfied with this decision; ri1 = use mobile websites in the next 12 months; ri2 = use mobile app in the next 12 months.

The findings of confirmatory factor analysis indicate that Chi-Square value χ^2 is equal to 994.088 (df = 168, p = 0.000). The large χ^2 is normally due to two reasons: one is large sample size and another reason is observed variables are not equally distributed (Cheng & Furnham, 2017). In the present study, since most of items follow the normal distribution, hence there is a high probability that this large χ^2 is due to large sample size. The root mean square error of approximation (RMSEA) indicates a measure of the discrepancy in fit per degrees of freedom. If it is less than 0.050, meaning that the proposed model has a good model fit. For the present study, RMSEA is equal to 0.076, indicating that it is an acceptable model fit. In addition, according to Bentler (1990), if the values of Comparative Fit Index (CFI), the final index of choices, and Tucker Lewis Index (TLI), or Non-normed Fit Index are greater than 0.90, then it represents a good model fit. The findings of the present study show that the values of TLI and CFI are 0.965 and 0.972, respectively. In summary, the seven-factor structure provides an acceptable model fit (χ^2 = 994.088, df = 168; TLI = 0.965, CFI = 0.972, RMSEA = 0.076). In other words, since both TLI and CFI are greater than 0.9, and RMSEA is greater than 0.07, which is between 0.05 and 0.08, showing that the proposed research framework is acceptable.

Table 36 reveals the correlations between each dimension among seven constructs in the proposed research framework. Fornell and Larcker (1981a) suggested comparing AVE with the squared correlations for each pair of the dimensions to test discriminant validity. That is, if AVE is greater than squared correlations, then the discriminant validity can be proved. Results of the present study show that discriminant validity is achieved. Moreover, since AVE is greater than 0.50, which confirms the convergent validity. Meanwhile, the attributes involved in each dimension are representative because construct reliability of each dimension is greater than 0.70. Results show that the values of Cronbach's alpha in each dimension range from 0.920 to 0.974.

Table 36. Correlations (squared correlations), reliability, AVE, and mean

	MF	MU	ATT	SN	PBC	CS	RI
MF	1.000						
MU	.385(.148)	1.000					
ATT	.350(.123)	.842(.709)	1.000				
SN	.328(.108)	.865(.748)	.847(.717)	1.000			
PBC	.386(.149)	.946(.895)	.868(.753)	.891(.794)	1.000		
CS	.314(.099)	.857(.734)	.808(.652)	.840(.706)	.882(.778)	1.000	
RI	.295(.087)	.816(.666)	.795(.632)	.810(.656)	.839(.704)	.793(.629)	1.000
Reliability	.920	.974	.967	.966	.966	.839	.755
AVE	.854	.888	.909	.879	.906	.743	.652
Mean	5.7093	5.4835	5.1441	5.1775	5.3898	5.3777	5.1377
Std. Dev.	1.46853	1.58679	1.53082	1.49632	1.57692	1.49814	1.54298

Note:

Correlation is significant at the 0.01 level (2-tailed).

MF = Mobile functionality; MU = mobile usability; ATT = attitude; SN = subjective norms; PBC = perceived behavioral control; CS = customer satisfaction; RI = repurchase intention; AVE=Average Variance Extracted. Mean values are based on 7-point scales. All correlations are significant at 0.01 level (2-tailed).

5.8 Mediating effects of attitude, subjective norms, and perceived behavioral control

To test the mediating effects of attitude, subjective norms, and perceived behavioral control upon the relationship between mobile functionality and customer satisfaction within the context of mobile payment for hotel reservations, first and foremost, the relationship between mobile functionality and customer satisfaction should be significant. Similarly, to test the mediating effects of attitude, subjective norms, and perceived behavioral control upon the relationship between mobile usability and customer satisfaction, the relationship between mobile usability and customer satisfaction should be significant. Table 37 shows the relationships between mobile functionality and customer satisfaction, and between mobile usability and customer satisfaction.

Table 37. Impacts of mobile functionality and mobile usability

Dimensions	Beta coefficients	S.E.	C.R.	P
MF → CS	0.016	0.018	0.893	0.372
MU → CS	0.844	0.015	56.203	***

Note:

MF = Mobile functionality, MU = Mobile usability, CS = Customer satisfaction

Figure 20 indicates that in the context of mobile payment for hotel reservations, functionality toward mobile payment does not significantly affect customer satisfaction (p = 0.372), although previous studies found that mobile functionality in general positively affects customer satisfaction for hotel reservations (Park et al., 2007; Wang & Wang, 2010). Thus, the mediating effects of attitude, subjective norms, and perceived behavioral control upon the relationship between mobile functionality and customer satisfaction do not exist. By contrast, the mediating effects of attitude, subjective norms, and perceived behavioral control exist between mobile usability and customer satisfaction because the relationship is positive, and is significant at 0.001 level. The findings of the present study are similar to that of previous studies (Schierz et al., 2010; Wang et al., 2016b).

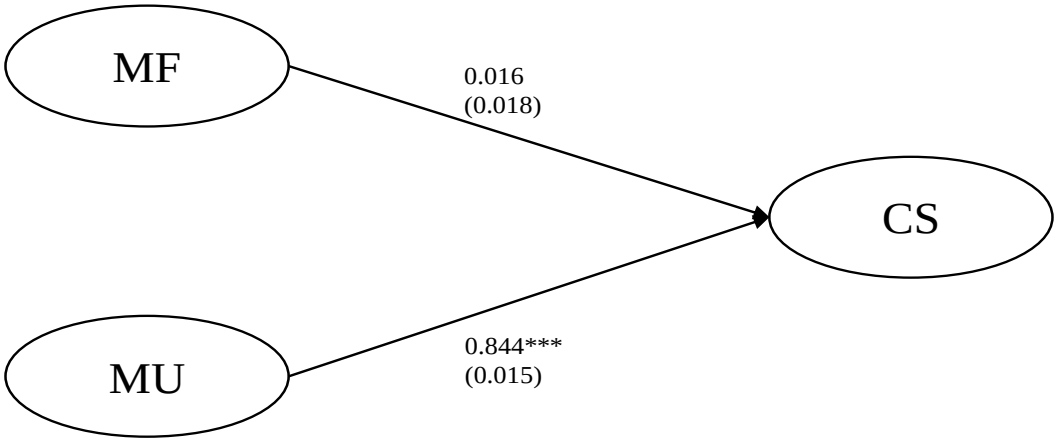


Figure 20. Impacts of mobile functionality and mobile usability

Before adding the dimensions attitude, subjective norms, and perceived behavioral control to the model, mobile usability has a positive significant relationship on customer satisfaction, and the relationship is significant at 0.001 level. After adding the dimensions attitude, subjective norms, and perceived behavioral control to the model, the relationship between mobile usability and customer satisfaction is not significant ($p = 0.349$) as shown in Table 38. Nevertheless, positive relationships are found between mobile usability and attitude, between mobile usability and subjective norms, and between mobile usability and perceived behavioral control. Hence, attitude, subjective norms, and perceived behavioral control are complete mediators upon the relationship between mobile usability and customer satisfaction within the context of mobile payment for hotel reservations (Figure 21).

Table 38. Mediating effects of attitude, subjective norms, and perceived behavioral control

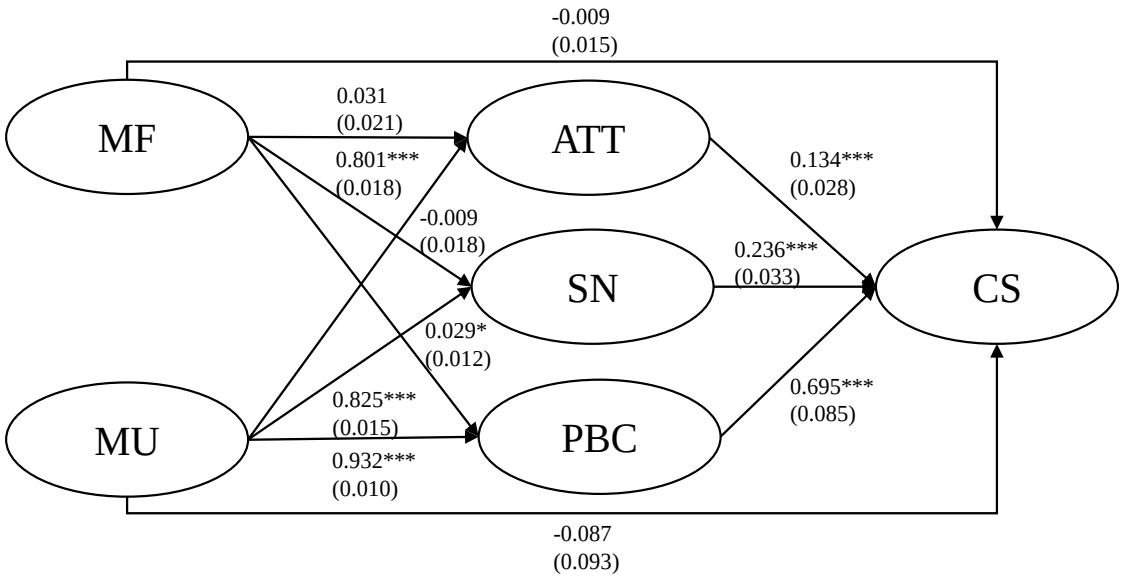
Dimensions			Beta estimates	S.E.	C.R.	P-value	Result
MU	→	**CS**	-0.087	0.093	-0.936	0.349	Not significant
MU	→	**ATT**	0.801	0.018	45.675	0.000	Significant
MU	→	**SN**	0.825	0.015	53.660	0.000	Significant
MU	→	**PBC**	0.932	0.010	89.188	0.000	Significant

Note:

MU = Mobile usability, CS = Customer satisfaction, ATT = Attitude, SN = Subjective norms, PBC = Perceived behavioral control

The present study further discloses that the influence of perceived behavioral control is greater than subjective norms and attitude, although the study of Mao and Lyu (2017) revealed that attitude has a greater influence than subjective norms and perceived behavioral control. The findings of the present study are matched with previous studies to some extent (Diatmika, Irianto, & Baridwan, 2016; Doosti, Jalilvand, Asadi, Khazaei Pool, & Mehrani Adl, 2016; Mao & Lyu, 2017; Schüz, Li, Hardinge, McEachan, & Conner, 2017). For example, the recent study

of Schüz et al. (2017) in psychology unearthed that attitude, subjective norms, and perceived behavioral control act as mediators in theory of planned behavior. Moreover, by adopting technology acceptance model, the mediating roles of attitude between perceived usefulness and behavioral intention, and between perceived ease of use and behavioral intention have been proved the study of Diatmika et al. (2016). Doosti et al. (2016) also proved the mediating effect of attitude between electronic word-of-mouth (e-WOM) and the intention of tourists to visit a destination. In addition, attitude is found to mediate the relationship between perceived value and repurchase intention of Airbnb, subjective norms are found to mediate the relationship between e-WOM and repurchase intention of Airbnb, but the perceived behavioral control does not mediate the relationship between familiarity and repurchase intention of Airbnb (Mao & Lyu, 2017).



Note:

**Correlation is significant at the 0.05 level (2-tailed).*

**** Correlation is significant at the 0.001 level (2-tailed).*

Figure 21. Mediating effects of attitude, subjective norms, and perceived behavioral control

5.9 Mediating effect of customer satisfaction

To test the mediating effects of customer satisfaction upon the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention, first and foremost, the relationship of the aforementioned each pair should be significant. Table 39 and Figure 22 reveal that the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, between perceived behavioral control and repurchase intention are all significant at 0.001 level (p = 0.000).

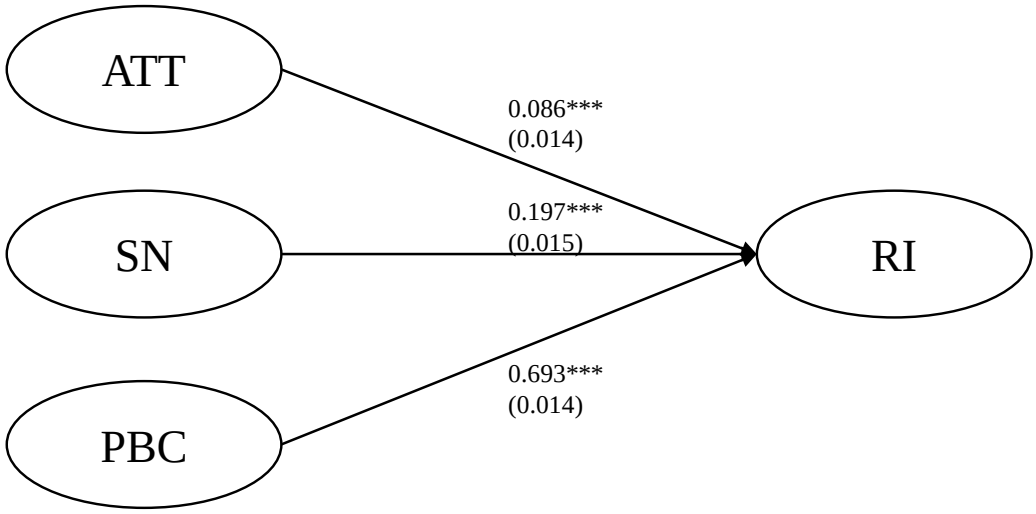
Table 39. Impacts of attitude, subjective norms, and perceived behavioral control

Dimensions			Beta estimates	S.E.	C.R.	p-value	Result
ATT	→	**RI**	0.086	0.015	5.786	0.000	Significant
SN	→	**RI**	0.197	0.015	12.897	0.000	Significant
PBC	→	**RI**	0.693	0.014	47.825	0.000	Significant

Note:
ATT = Attitude, SN = Subjective norms, PBC = Perceived behavioral control, RI = Repurchase Intention

In mid-2000s, within the context of destination selection, Lam and Hsu (2006) unearthed that attitude and perceived behavioral control positively affect the intention of Mainland Chinese tourists to visit Hong Kong. Within the context of e-commerce, the findings of the present study are matched with that of Bhatiasevi and Yoopetch (2015) that social norms are positively related to the intention of the use of e-booking, as well as the reuse intention of consumers. Regarding the use of mobile payment service, Gao, Yang, Guo, and Jing (2018) also proved that social influences significantly affect the intention of consumers to use mobile payment service. Results of the present study further verify that attitude, subjective norms, and perceived behavioral control are positively and significantly related to repurchase intention within the context of

mobile payment for hotel reservations. Nevertheless, whether the impacts of attitude, subjective norms, and perceived behavioral control on the repurchase intention are direct or are transferred through customer satisfaction is not known. Thus, to further examine whether the impacts are transferred through customer satisfaction, the dimension customer satisfaction was added into the model.



Note:

**** Correlation is significant at the 0.001 level (2-tailed).*

Figure 22. Impacts of attitude, subjective norms, and perceived behavioral control

After adding the dimension customer satisfaction into the model, Table 40 reveals that the relationships between attitude and repurchase intention; between subjective norms and repurchase intention; and between perceived behavioral control and repurchase intention are not significant, but customer satisfaction has a positive and significant effect on repurchase intention; and the relationship is significant at 0.001 level.

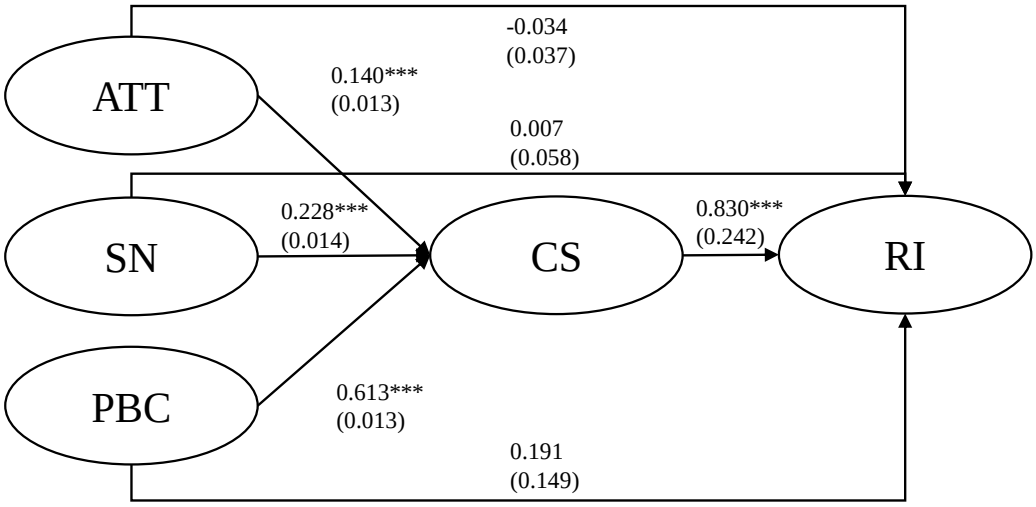
Table 40. Mediating effect of customer satisfaction

Dimensions			Beta estimates	S.E.	C.R.	P-value	Result
ATT	→	**RI**	-0.034	0.037	-0.917	0.359	Not significant
SN	→	**RI**	0.007	0.058	0.119	0.905	Not significant
PBC	→	**RI**	0.191	0.149	1.279	0.201	Not significant
CS	→	**RI**	0.830	0.242	3.433	0.000	Significant

Note:

ATT = Attitude, SN = Subjective norms, PBC = Perceived behavioral control, CS = Customer satisfaction, RI = Repurchase Intention

Thus, the findings of the present study show that customer satisfaction has a complete mediating effect on the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention, although the studies of Mittal and Kamakura (2001) and Chen and Chen (2017) unearthed that no relationship is found between customer satisfaction and repurchase intention. Nevertheless, the finding of the present study illustrated that customer satisfaction is a complete mediator of repurchase intention. Results of the present study prove the mediating role of customer satisfaction within the context of mobile payment for hotel reservations, although without the intervention of customer satisfaction, attitude, subjective norms, and perceived behavioral control significantly affect the repurchase intention of consumers (Figure 23).



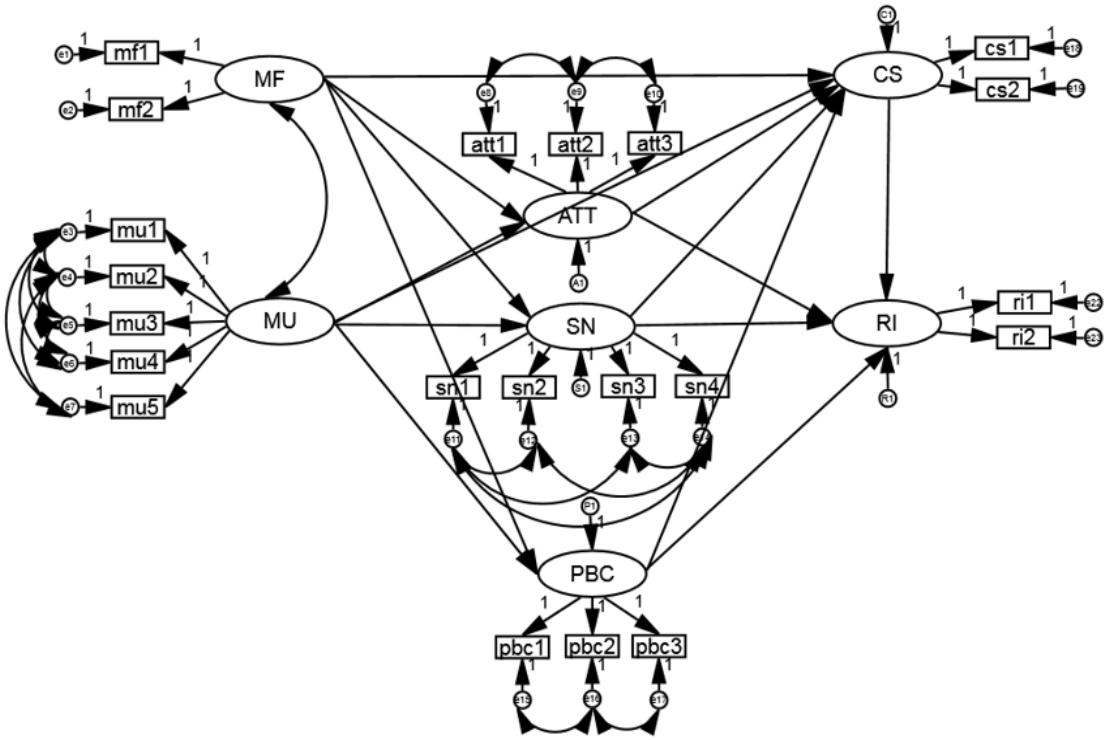
Note:

**** Correlation is significant at the 0.01 level (2-tailed).*

Figure 23. Mediating effect of customer satisfaction

5.10 Regression paths of the proposed conceptual model

Figure 24 shows the seven-factor structure of the proposed conceptual model. The model is acceptable based on the indicators (χ^2 = 1006.048, df = 171, TLI = 0.965, CFI = 0.971). Since both TLI and CFI are greater than 0.9, and RMSEA is 0.075, hence the indicators show that the model is acceptable. Table 41 further lists the unstandardized regression weights and standardized regression weights of each dimension and the attributes involved in each dimension. The findings reveal that each attribute under each dimension of the proposed research framework can represent the dimension well.



Note:

MF = mobile functionality; MU = mobile usability; ATT = attitude; SN = subjective norms; PBC = perceived behavioral control; CS = customer satisfaction; RI = repurchase intention; mf1 = mobile payment flow; mf2 = mobile payment information; mu1 = convenience; mu2 = quickness; mu3 = in-time notification; mu4 = compatibility; mu5 = safety; att1 = enjoyable; att2 = fun; att3 = pleasant; sn1 = wish me; sn2 = support me; sn3 = most people use; sn4 = if they use, I use; pbc 1 = not beyond my control; pbc 2 = confident; pbc 3 = good; cs1 = a wise decision; cs2 = satisfied with this decision; ri1 = use mobile websites in the next 12 months; ri2 = use mobile app in the next 12 months.

Figure 24. A seven-factor structure of the proposed research framework

Table 41. Unstandardized regression weights vs. standardized regression weights

Dimensions			Unstandardized regression weights	Standardized regression weights
MF	→	**ATT**	0.031	0.030
MF	→	**SN**	-0.009	-0.008
MF	→	**PBC**	0.028	0.026
MU	→	**ATT**	0.801	0.860
MU	→	**SN**	0.825	0.898
MU	→	**PBC**	0.933	0.974
ATT	→	**CS**	0.135	0.139
SN	→	**CS**	0.234	0.238
PBC	→	**CS**	0.681	0.722
MF	→	**CS**	-0.013	-0.013
MU	→	**CS**	-0.071	-0.078
CS	→	**RI**	0.775	0.768
ATT	→	**RI**	-0.044	-0.048
SN	→	**RI**	0.001	0.001
PBC	→	**RI**	0.262	0.275
mf1	→	**MF**	1.000	0.908
mf2	→	**MF**	1.000	0.939
mu1	→	**MU**	1.000	0.966
mu2	→	**MU**	1.000	0.967
mu3	→	**MU**	1.000	0.960
mu4	→	**MU**	1.000	0.959
mu5	→	**MU**	1.000	0.875
sn1	→	**SN**	1.000	0.925
sn2	→	**SN**	1.000	0.953
sn3	→	**SN**	1.000	0.940

Dimensions			Unstandardized regression weights	Standardized regression weights
sn4	→	**SN**	1.000	0.932
att1	→	**ATT**	1.000	0.965
att2	→	**ATT**	1.000	0.952
att3	→	**ATT**	1.000	0.939
pbc1	→	**PBC**	1.000	0.957
pbc2	→	**PBC**	1.000	0.950
pbc3	→	**PBC**	1.000	0.946
cs1	→	**CS**	1.000	0.802
cs2	→	**CS**	1.000	0.941
ri1	→	**RI**	1.000	0.723
ri2	→	**RI**	1.000	0.922

Table 42 indicates the results of hypothesis testing among different dimensions. Regarding the impact of functionality toward mobile payment on customer satisfaction, since the p value is 0.331, which is greater than 0.05, hence H1 is not supported. In other words, functionality toward mobile payment does not significantly affect customer satisfaction, although the findings of previous studies indicated that mobile functionality positively affects customer satisfaction for hotel reservations (Park et al., 2007; Wang & Wang, 2010). The possible explanation within the context of mobile payment for hotel reservations is that at present, consumers have been accustomed to the use of mobile payment, and they may not need to refer to the functionality of mobile payment such as mobile payment flow to complete mobile payment for hotel reservations, hence functionality toward mobile payment does not affect customer satisfaction. H3a is not supported because the p value is 0.128, which is greater than 0.05. In other words, functionality toward mobile payment does not significantly affect attitude. H3b is not supported because the p value is 0.623, which is greater than 0.05, showing that

functionality toward mobile payment does not significantly affect subjective norms. Results of H3a and H3b further prove the little influence of functionality toward mobile payment on attitude and subjective norms. The findings are not matched with that of the previous studies of Murphy et al. (2016) and Wang et al. (2016a) that mobile-friendly content offered by OTAs affects the attitudes of users, and the information delivered by mobile technology positively affects the decision-making of consumers. H3c is supported, and the relationship between mobile functionality and perceived behavioral control is significant at 0.05 level. That is, mobile functionality has a positive and significant effect on perceived behavioral control ($p = 0.022$) within the context of mobile payment for hotel reservations. This positive relationship identified is matched with the finding of Lee et al. (2015) that the perceived ability to control the risks positively affects user's confidence when consumers are involved in the interaction process.

H2 is not supported because the p value is 0.419, which is greater than 0.05. Thus, usability toward mobile payment does not significantly affect customer satisfaction, although previous studies proved the positive relationship between mobile usability and customer satisfaction for mobile hotel reservations (Schierz et al., 2010; Wang et al., 2016b). Nevertheless, H4a, H4b, H4c, H5a, H5b, and H5c are supported, indicating that the impact of usability toward mobile payment on customer satisfaction is transferred through attitude, subjective norms, and perceived behavioral control. H4a, H4b, and H4c are supported, and the relationships are all significant at 0.001 level. In other words, mobile usability positively and significantly affects attitude, subjective norms, and perceived behavioral control. The findings are matched with that of Ladhari (2010) and Okazaki et al. (2014) that mobile usability significantly affects the attitude of a consumer, and that of Mauri and Minazzi (2013) that the reviews (i.e. subjective norms) posted by hotel guests significantly affect the decision-making of other consumers.

H5a, H5b, and H5c are all supported, and the relationships are significant at 0.001 level. In other words, attitude, subjective norms, and perceived behavioral control positively and significantly affect customer satisfaction. The findings are similar to that of previous study that enjoyment (i.e. attitude) and value (i.e. subjective norms) significantly affect customer satisfaction within mobile shopping context (Kim et al., 2015). H6a and H6b are not supported since the p values are 0.263 and 0.985, respectively, and the values are greater than 0.05. In other words, attitude and subjective norms do not significantly affect repurchase intention, indicating that within the context of mobile payment for hotel reservations, the impacts of attitude and subjective norms on repurchase intention of hotels are transferred through customer satisfaction. H6c is supported, and the relationship between perceived behavioral control and repurchase intention is significant at 0.1 level. H7 is supported, which proves that within the context of mobile payment for hotel reservations, customer satisfaction also positively affects the repurchase intention of consumers, and the relationship is significant at 0.001 level ($p = 0.000$). This finding has been proved by the studies of Ladhari and Michaud (2015) and Su et al. (2016) that once the customers are satisfied, they are more likely to have repurchase intention. In summary, H3c, H4a, H4b, H4c, H5a, H5b, H5c, H6c, and H7 are supported, while the remaining hypotheses (H1, H2, H3a, H3b, H6a, H6b) are not supported.

Table 42. Hypothesis testing

Dimensions			Estimate	S.E.	C.R.	p	Hypothesis	Supported/ Not supported
MF	→	**CS**	-0.013	0.014	-0.399	0.331	H1	Not supported
MU	→	**CS**	-0.071	0.087	-0.809	0.419	H2	Not supported
MF	→	**ATT**	0.031	0.021	1.523	0.128	H3a	Not supported
MF	→	**SN**	-0.009	0.018	-0.491	0.623	H3b	Not supported
MF	→	**PBC**	0.028	0.012	2.293	0.022	H3c	Supported
MU	→	**ATT**	0.801	0.018	45.674	***	H4a	Supported
MU	→	**SN**	0.825	0.015	53.659	***	H4b	Supported
MU	→	**PBC**	0.933	0.010	89.419	***	H4c	Supported
ATT	→	**CS**	0.135	0.027	4.939	***	H5a	Supported
SN	→	**CS**	0.234	0.033	7.122	***	H5b	Supported
PBC	→	**CS**	0.681	0.082	8.350	***	H5c	Supported
ATT	→	**RI**	-0.047	0.042	-1.119	0.263	H6a	Not supported
SN	→	**RI**	0.001	0.063	0.018	0.985	H6b	Not supported
PBC	→	**RI**	0.262	0.151	1.742	0.081	H6c	Supported
CS	→	**RI**	0.775	0.231	3.361	***	H7	Supported

Note:

MF = mobile functionality; MU = mobile usability; ATT = attitude; SN = subjective norms; PBC = perceived behavioral control; CS = customer satisfaction; RI = repurchase intention

5.11 Chapter summary

This chapter introduces multivariate data analysis methods to test the impacts of mobile functionality and usability on the repurchase intention of hotels. First, descriptive statistics is provided. Subsequently, principal component analysis and exploratory factor analysis are conducted to reduce the dimensions and find out the attributes that can represent each dimension well. Finally, structural equation modeling is adopted to examine the structural relationships of the seven constructs within the context of mobile payment for hotel reservations. Through examining the mediating effects of attitude, subjective norms, and perceived behavioral control on the relationships between mobile functionality and customer satisfaction, between mobile usability and customer satisfaction; and the mediating effects of customer satisfaction on the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention, the findings indicate that attitude, subjective norms, and perceived behavioral control are complete mediators on the relationship between mobile usability and customer satisfaction. Similarly, customer satisfaction is also a complete mediator upon the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention.

Chapter 6. Implications and conclusions

6.1 Chapter introduction

Chapter 6 discusses about the theoretical and practical contributions of the present study. In terms of theoretical contribution, the present study is based on the conceptual framework of website evaluation, and tests its applicability within the context of mobile payment for hotel reservations. The findings prove that the conceptual model of website evaluation is applicable within the context of mobile payment for hotel reservations to some extent. Results show that theory of planned behavior can be largely applied to the context of mobile payment for hotel reservations as well. Furthermore, by integrating the conceptual framework of website evaluation into theory of planned behavior, the present study develops a new research framework.

6.2 Recent theoretical contributions

Mobile payment is regarded as the revolution of e-commerce along with the development of information and communications technology. Although previous studies have adopted website evaluation model to evaluate the impacts of website functionality and usability on customer satisfaction, the detailed aspects of functionality and usability are not clear. Hence, the present study integrated the conceptual model of website evaluation into theory of planned behavior to investigate the impacts of functionality and usability on repurchase intention within the context of mobile payment for hotel reservations.

By integrating the conceptual model of website evaluation into theory of planned behavior, the present study not only investigates the detailed aspects (i.e. mobile functionality, mobile usability) related to attitude, subjective norms, and perceived behavioral control, but also improves the conceptual model of website evaluation by examining the mediating effects of attitude, subjective norms, and perceived behavioral control on the relationships between mobile

functionality and customer satisfaction; and between mobile usability and customer satisfaction. The findings show that attitude, subjective norms, and perceived behavioral control are complete mediators on the relationship between mobile usability and customer satisfaction, but are not mediators on the relationship between mobile functionality and customer satisfaction. In addition, results indicate that customer satisfaction is a complete mediator upon the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention.

On the other hand, the present study tests the applicability of theory of planned behavior into the context of mobile payment for hotel reservations. Although previous studies prove that customer satisfaction is a decisive factor that affects the repurchase intention of consumers, whether the effect is transferred through attitude, subjective norms, and perceived behavioral control is not clear within the context of mobile payment for hotel reservations. By adding the attribute customer satisfaction into the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention, results show that customer satisfaction completely mediates the relationships between attitude and repurchase intention, between subjective norms and repurchase intention, and between perceived behavioral control and repurchase intention. The findings prove that the aforementioned relationships are transferred through customer satisfaction.

In conclusion, the present study integrates website evaluation model into theory of planned behavior, extends theory of planned behavior into the context of mobile payment for hotel reservations, and proves its applicability. As a result, the present study develops and proves

an improved research framework within the context of mobile payment for hotel reservations, and the proposed research framework can be used as a reference for future studies.

6.3 Practical implications for industry practitioners

The findings of the present study indicate that mobile functionality does not affect customer satisfaction. Mobile usability does not directly affect customer satisfaction; it is found that the effect of mobile usability is transferred through attitude, subjective norms, and perceived behavioral control within the context of mobile payment for hotel reservations. That is, when consumers use mobile payment for hotel reservations, consumers focus more on usability rather than functionality. Here are some examples of the comments provided by respondents in the questionnaire survey. For example, respondents commented that "When use mobile websites or apps to make hotel reservation via mobile payment, there is too little information about mobile payment." They also commented "Mobile payment information is not detail-oriented." Thus, providing detailed mobile payment information, such as a full list of mobile payment methods that are commonly used by consumers rather than ask them to choose from drop-down menu can be considered by hotel managers to communicate with OTAs to improve mobile functionality.

In addition, the findings show that mobile usability positively affects attitude, subjective norms, and perceived behavioral control. Moreover, attitude, subjective norms, and perceived behavioral control significantly affect customer satisfaction, and perceived behavioral control also significantly affects the repurchase intention of consumers. For instance, the comments of respondents reveal that "Since mobile payment is convenient, hence I am satisfied." and "Mobile payment is convenient and the transaction is quick, which brings me pleasant experience; using app for mobile payment makes me feel more satisfied compared with using mobile websites." Thus, usability toward mobile payment, that is, "convenience of mobile payment", and

“quickness of mobile payment” are considered as important attributes that affect the attitude of consumers of using mobile payment for hotel reservations. Furthermore, some respondents commented that “The overall process of mobile payment for hotel reservations is convenient and quick, many people in my social network are using mobile payment for hotel reservations.” Respondents also mentioned “Mobile payment is convenient and the transaction is fast, and the safety is assured. There are also some promotions, and most people in my social network rate mobile payment highly.” The comments show that the two attributes “convenience of mobile payment”, and “quickness of mobile payment” are also important factors that affect subjective norms and the perceived behavioral control. Moreover, one of the respondents commented that “Using mobile payment for hotel reservations is convenient and safe, and it is easy to operate, I am satisfied, hence I will make next purchase.” The above evidence shows that if customers are able to operate and deal with mobile payment transaction, he or she will be willing to make next purchase.

Accordingly, hotel managers should communicate with their cooperating OTAs to assure the convenience of mobile payment, and the speed of mobile payment to make consumers feel that they can control mobile payment well for hotel reservations because perceived behavioral control not only affects customer satisfaction but also affects the repurchase intention of consumers. Hence, simplify the operation can be considered by hotel managers and its cooperating OTAs. For example, the comments of the respondents expressed that record mobile payment preference can further improve the convenience and quickness of the transaction of hotel reservations. In addition, the attribute safety of mobile payment should be taken into consideration as well. For instance, providing security statements, such as free cancelation or 24-hour refund guarantee can increase customer satisfaction to a great extent (Park & Gretzel,

2007). Respondents also mentioned that "Mobile payment for hotel reservation is convenient, I am willing to make next purchase."; "Mobile payment is very convenient, I will continue to use mobile payment for hotel reservations." The above comments indicate that customer can even become loyalty customers based on the attribute "convenience of mobile payment". The comments of the respondents further verify the positive relationship between customer satisfaction and repurchase intention. For example, "I am currently satisfied with mobile payment, I have downloaded relevant apps for hotel reservations, and I will continue use mobile payment in the future." In other words, once the customers are satisfied with the transaction, there is a high possibility that they will have high repurchase intention next time.

Quality improvement of mobile websites

In summary, since all respondents agreed that the operation of mobile app is better than mobile websites, as they mentioned that "The speed of mobile websites is slow and sometimes stuck in one page." They also mentioned "I do not like to use mobile websites because I do not think it is safe, but when using app, I feel it is quite safe." First of all, hotel managers should improve the quality of mobile websites by communicating with their cooperating OTAs. Second, hotel managers should improve the following aspects: operation simplification, safety assurance, and experience management so as to enhance the repurchase intention of consumers.

Operation simplification and safety assurance of mobile payment for hotel reservations

In terms of operation simplification, some of the respondents mentioned that "We hope that mobile payment can be more easily operated." Thus, it is of great importance to make sure that mobile payment can be easily operated by consumers. Record the preferences of consumers can be regarded as an effective way to simplify the operation. In reference to safety assurance,

many respondents said that “By making sure that mobile payment for hotel reservations is safe, I will continue use mobile payment.” Some respondents stated that “Although mobile payment is convenient, I am still concerned about the disclosure of my personal information that is provided during mobile payment process.”; and “I believe safety problem still exists although it is convenient to use mobile payment.” The above evidence shows that safety is an important factor that affects the repurchase intention of customers. Respondents hope that relevant software can be developed to protect the personal information of consumers. Thus, safety management should be considered by hotel managers through mutual agreement with OTAs, particularly for mobile websites, such as 24-hour refund guarantee. In conclusion, mobile apps and mobile websites are the two main forms of the existence of OTAs for consumers to make hotel reservations via mobile payment. Although respondents highly appreciate simplifying the process of mobile payment, hotel managers should still take the safety and security issue into consideration. Thus, how to simplify the process of mobile payment and assure the safety of mobile payment in the meantime is of great necessity for hotel managers to contemplate.

Customer experience improvement of mobile payment for hotel reservations

On the contrary, some respondents commented that “There is nothing to enjoy; and feel good and pleasant during mobile payment process, I am not making money, I am paying for the bill, just make sure that mobile payment process is smooth.” Since respondents mentioned that the experience of mobile payment for hotel reservations affects his or her satisfaction, and mobile payment has become a habit as part of life, hence how to enhance the experience of mobile payment should be considered by hotel managers. As some respondents mentioned that “If the hotel that I reserve is fully occupied, I can get fully refund, and there is no risk of making such transaction. It will be a very good user experience.” Moreover, respondents said that “I care

very much about the in-time provision of mobile payment notification or feedback because this can enhance my satisfaction, in-time refund is also necessary." Some respondents recommended giving back the deposit flexibly to improve customer satisfaction. Thus, flexibility and fully refund can be considered as feasible ways to ensure safety and improve customer experience in the meantime.

6.4 Conclusions and outlook

Mobile payment, as a revolution of e-commerce, has become a common practice in people's daily life, and hospitality is not an exception in terms of mobile payment application. At present, it becomes quite popular to use mobile payment for hotel reservations. Based on the different stages of consumer decision-making process, the present study first evaluates hotel reservation information that is provided by OTAs and then examines mobile payment for hotel reservations based on the combination of the conceptual model of website evaluation and theory of planned behavior.

Results of hotel reservation information evaluation indicate that OTAs are doing well in providing detailed hotel location information, but they are not doing quite well in providing detailed information such as "hotel change policy". Moreover, in the aspect of communication, respondents perceive that reading hotel-related comments is easy, but it is not easy to find the request form. In addition, in reference to transaction and interaction, respondents perceive that the transaction is easy and quick, and it is easy to login the membership. Furthermore, the overall quality of hotel information is complete, reliable, and up to date. In general, customers are satisfied with the hotel reservation information provided by OTAs. Thus, hotel managers should communicate with OTAs to devote efforts in providing detailed information about hotel change policy, offering request form to customers so as to better satisfy their needs.

The present study also examined mobile payment for hotel reservations by combing the conceptual framework of website evaluation and theory of planned behavior. In total, 15 hypotheses are advocated, with nine hypotheses supported (H3c, H4a, H4b, H4c, H5a, H5b, H5c, H6c, and H7). The remaining six hypotheses (H1, H2, H3a, H3b, H6a, and H6b) are not supported. The reason to explain why H1 is not supported is that at present, consumers have been accustomed to the use of mobile payment, and they may not need to refer to the functionality of mobile payment such as mobile payment flow to complete mobile payment for hotel reservations, hence functionality toward mobile payment does not affect customer satisfaction. Results of H3a and H3b further prove the little influence of functionality toward mobile payment on attitude and subjective norms. H2 is not supported because the impact of usability toward mobile payment on customer satisfaction is transferred through attitude, subjective norms, and perceived behavioral control. H6a and H6b are not supported because the impacts of attitude and subjective norms on the repurchase intention of hotels are transferred through customer satisfaction.

The findings prove the partial applicability of the conceptual model of website evaluation to mobile payment for hotel reservations. By adding theory of planned behavior, results show that mobile functionality does not significantly affect customer satisfaction. The effect of mobile usability on customer satisfaction is transferred through attitude, subjective norms, and perceived behavioral control. In addition, the impact of customer satisfaction on repurchase intention has been proved within the context of mobile payment for hotel reservations. The developed and proved research framework can be used as a reference for future studies. The comments of respondents further indicate that detailed mobile payment information is an important factor that drives customer satisfaction. In terms of mobile usability, convenience is what the respondents

appreciate, but they are still concerned about the safety and security issue. Thus, hotel managers should on the one hand simplify the mobile payment operation process, and on the other hand ensure the safety and security issue of mobile payment.

6.5 Limitations and future research

There are several limitations of the present study. The first limitation is that the present study investigated mobile payment for hotel reservations within the context of first-tier cities in China, whether the findings can be applied to second-tier cities or below, or other countries and regions are not clear. Future studies are suggested to reduplicate the present study in other countries or regions to test the applicability of the findings. Moreover, all the statements included in the questionnaires are positive and the section headings such as "social norms" are included in the questionnaire. Hence, reverse questions/statements can be considered to add and section headings are suggested to be removed in future studies. Additionally, future studies can take cultural elements into consideration to examine the behavioral differences of consumers in different cultural backgrounds. Also, future studies can identify the behavioral differences of consumers based on the demographic information such as age. Furthermore, qualitative studies can be conducted to have an in-depth understanding of the underlying reasons of using mobile payment for hotel reservations. On the other hand, future studies can study mobile payment for hotel reservations from the perspective of suppliers such as hotel managers.

6.6 Chapter summary

In summary, this chapter summarizes the findings of the present study, and provides the theoretical contributions and practical implications of the present study. The developed and proved research framework can be used as a reference for future studies. In addition, hotel managers can on the one hand simplify the process of mobile payment with payment safety assurance, and on the other hand, enhance customer experience by in-time refund guarantee. Finally, this chapter discusses the limitations and provides directions for future research.

References

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: why and how of it. *Indian Journal of Medical Specialties, 4*(2), 330-333.

Adukaite, A., Reimann, A. M., Marchiori, E., & Cantoni, L. (2014). Hotel mobile apps. The case of 4 and 5 star hotels in European German-speaking countries. In Z. Xiang & I. Tussyadiah (Eds.), *Information and Communication Technologies in Tourism 2014* (pp. 45-57). Cham, Switzerland: Springer International Publishing.

Agarwal, R., & Venkatesh, V. (2002). Assessing a firm's web presence: a heuristic evaluation procedure for the measurement of usability. *Information Systems Research, 13*(2), 168-186.

Agyeiwaah, E., Adongo, R., Dimache, A., & Wondirad, A. (2016). Make a customer, not a sale: Tourist satisfaction in Hong Kong. *Tourism Management, 57*, 68-79.

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior*. Berlin Heidelberg, Germany: Springer.

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology, 52*(1), 27-58.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology, 32*(4), 665–683.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, J. (1991). The theory of planned behavior. *Organizational Behvaior and Human Decision Processes, 50*(2), 179-211.

Aladwani, A. M., & Palvia, P. C. (2002). Developing and validating an instrument for measuring userperceived web quality. *Information & Technology, 39*(6), 467-476.

Albadvi, A., & Saddad, G. (2012). Web site evaluation of Iranian tourism and hospitality organizations: an e-commerce Web site features model. *Journal of Hospitality Marketing & Management, 21*(2), 155-183.

Alipay. (2016). *Our Products*. Retrieved December 12, 2017, from https://global.alipay.com/product/overview.htm.

Aljahwari, D. S., Sirakaya-Turk, E., Altintas, V., Okumus, F., & Okumus, F. (2016). Evaluating communication competency of tour guides using a modified importance-performance analysis (MIPA). *International Journal of Contemporary Hospitality Management, 28*(1), 195-218.

Anand, P., & Sternthal, B. (1990). Ease of message processing as a moderator of repetition effects in advertising. *Journal of Marketing Research, 27*(3), 345-353.

Anuar, J., Musa, M., & Khalid, K. (2014). Smartphone's application adoption benefits using mobile hotel reservation system (MHRS) among 3 to 5-star city hotels in Malaysia. *Procedia-Social and Behavioral Sciences, 130*, 552-557.

Appleinsider. (2016). *Apple Pay a hit in China with 3 million cards added in 2 days*. Retrieved December 12, 2017, from http://appleinsider.com/articles/16/03/03/apple-pay-a-hit-in-china-with-3-million-cards-added-in-2-days.

Au, Y. A., & Kauffman, R. J. (2008). The economics of mobile payments: understanding stakeholder issues for an emerging financial technology application. *Electronic Commerce Research and Applications, 7*(2), 141-164.

Au Yeung, T., & Law, R. (2004). Extending the modified heuristic usability evaluation technique to chain and independent hotel websites. *International Journal of Hospitality Management, 23*(3), 307-313.

Babbie, E., & Mouton, J. (2001). *The practice of social science research*. Cape Town, South Aferica: Oxford University Press Southern Africa.

Babin, B. J., & Griffin, M. (1998). The nature of satisfaction: an updated examination and analysis. *Journal of Business Research, 41*(2), 127-136.

Bagozzi, R. P. (1981). Evaluating structural equation models with unobservable variables and measurement error: a comment. *Journal of Marketing Research, 18*(3), 375-381.

Bai, B., Hu, C., & Jang, S. (2007). Examining e-relationship marketing features on hotel websites. *Journal of Travel & Tourism Marketing, 21*(2-3), 33-48.

Bai, B., Jang, S., & Hu, C. (2003). E-relationship marketing: an application to hotel website development. In H. Qu (Ed.), *2003 Annual I-CHRIE Conference* (pp. 8-12). Richmond, VA: Palm Springs.

Bai, B., Law, R., & Wen, I. (2008). The impact of website quality on customer satisfaction and purchase intentions: evidence from Chinese online visitors. *International Journal of Hospitality Management, 27*(3), 391-402.

Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., . . . Tourangeau, R. (2013). Summary report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology, 1*(2), 90-143.

Baloglu, S., & Pekcan, Y. A. (2006). The website design and Internet site marketing practices of upscale and luxury hotels in Turkey. *Tourism Management, 27*(1), 171-176.

Bastida, U., & Huan, T. C. (2014). Performance evaluation of tourism websites' information quality of four global destination brands: Beijing, Hong Kong, Shanghai, and Taipei. *Journal of Business Research, 67*(2), 167-170.

Bauernfeind, U., & Mitsche, N. (2008). The application of the data envelopment analysis for tourism website evaluation. *Information Technology & Tourism, 10*(3), 245-247.

BBC News. (2016). *Apple Pay to be available in China from this week*. Retrieved December 12, 2017, from http://www.bbc.com/news/technology-35601110.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238-246.

Bhatiasevi, V., & Yoopetch, C. (2015). The determinants of intention to use electronic booking among young users in Thailand. *Journal of Hospitality and Tourism Management, 23*, 1-11.

Blut, M., Frennea, C. M., Mittal, V., & Mothersbaugh, D. L. (2015). How procedural, financial and relational switching costs affect customer satisfaction, repurchase intentions, and repurchase behavior: A meta-analysis. *International Journal of Research in Marketing, 32*(2), 226-229.

Boden, R. (2017). *Apple Pay most popular mobile payment service among US retailers, survey finds*. Retrieved December 20, 2017, from https://www.nfcworld.com/2017/02/07/349958/apple-pay-popular-mobile-payment-service-us-retailers-survey-finds/.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.

Bonn, M. A., Furr, H. L., & Susskind, A. M. (1998). Using the Internet as a pleasure travel planning tool: An examination of the sociodemographic and behavioral characteristics among Internet users and nonusers. *Journal of Hospitality & Tourism Research, 22*(3), 303-317.

Brida, J. G., Meleddu, M., & Pulina, M. (2012). Factors influencing the intention to revisit a cultural attraction: the case study of the museum of modern and contemporary art in Rovereto. *Journal of Cultural Heritage, 13*(2), 167-174.

Bro, R., & Smilde, A. K. (2014). Principal component analysis. *Analytical Methods, 6*(9), 2812-2831.

Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management, 29*(4), 609-623.

Cai, L., Card, J. A., & Cole, S. T. (2004). Content delivery performance of world wide web sites of US tour operators focusing on destinations in China. *Tourism Management, 25*(2), 219-227.

Cano, V., & Prentice, R. (1998). Opportunities for endearment to place through electronic 'visiting': WWW homepages and the promotion of Scotland. *Tourism Management, 19*(1), 67-73.

Carsten, P. (2016). *Apple Pay takes on China's internet kings in mobile payments*. Retrieved December 12, 2017, from http://www.reuters.com/article/us-apple-payment-china-idUSKCN0VQ302.

CCTV. (2016). *Third-party mobile payment market in China*. Retrieved December 12, 2017, from http://english.cntv.cn/2016/02/19/VIDEbIpxVLPJJBpHUlvzv9ZM160219.shtml.

Chaffey, D., Mayer, R., Johnston, K., & Ellis-Chadwick, F. (2003). *Internet Marketing (2nd)*. Englewood Cliffs, NJ: Prentice-Hall.

Chan, E. S., Okumus, F., & Chan, W. (2017). The applications of environmental technologies in hotels. *Journal of Hospitality Marketing & Management, 26*(1), 23-47.

Chandra, S., Srivastava, S. C., & Theng, Y. L. (2010). Evaluating the role of trust in consumer adoption of mobile payment systems: an empirical analysis. *Communications of the Association for Information Systems, 27*(1), 561-588.

Chang, Y. W., & Chang, Y. H. (2010). Does service recovery affect satisfaction and customer loyalty? An empirical study of airline services. *Journal of Air Transport Management, 16*(6), 340-342.

Chen, C.-L., & Liao, J.-J. (2011). A fair online payment system for digital content via subliminal channel. *Electronic Commerce Research and Applications, 10*(3), 279-287.

Chen, C. C. V., & Chen, C. J. (2017). The role of customer participation for enhancing repurchase intention. *Management Decision, 55*(3), 547-562.

Chen, Q. (2016). *Tencent's charges for WeChat Pay users kick in amid fight for mobile payment marketshare*. Retrieved December 12, 2017, from http://www.cnbc.com/2016/03/01/tencents-charges-for-wechat-pay-users-kick-in-amid-fight-for-mobile-payment-marketshare.html.

Chen, X., & Li, S. (2017). Understanding continuance intention of mobile payment services: an empirical study. *Journal of Computer Information Systems, 57*(4), 287-298.

Chen, Y., & Lin, Z. (2018). Fashionability vis-à-vis rationality: investigating factors driving users' e-tourism website stickiness. *Current Issues in Tourism, 21*(1), 41-57.

Cheng, H., & Furnham, A. (2017). Early indicators of self-esteem in teenagers: Findings from a nationally representative sample. *Personality and Individual Differences, 116*, 139-143.

Cheung, C., & Law, R. (2009). Have the perceptions of the successful factors for travel web sites changed over time? The case of consumers in Hong Kong. *Journal of Hospitality & Tourism Research, 33*(3), 438-446.

Chi, C. G. Q. (2010). An examination of destination loyalty: differences between first-time and repeat visitors. *Journal of Hospitality & Tourism Research, 36*(1), 3-24.

China Internet Watch. (2014). *China has 641 Mln Internet users, 1.27 Bln mobile subscribers*. Retrieved December 12, 2017, from http://www.chinainternetwatch.com/9197/china-has-641-mln-internet-users-1-27-bln-mobile-subscribers/.

China Internet Watch. (2015). *China mobile payment reached $4.19 trillion, up by 445% in Q2 2015*. Retrieved May 23, 2018, from http://www.chinainternetwatch.com/14808/mobile-payment-q2-2015/.

China Internet Watch. (2016). *Ctrip, Tuniu, CY account for half of China OTA market in 2015*. Retrieved May 23, 2018, from https://www.chinainternetwatch.com/17141/online-travel-agent-market-2015/.

China Internet Watch. (2017a). *China online travel market overview Q1 2017*. Retrieved December 12, 2017, from https://www.chinainternetwatch.com/21494/online-travel-q1-2017/.

China Internet Watch. (2017b). *China third-party online payment market overview Q1 2017*. Retrieved December 12, 2017, from https://www.chinainternetwatch.com/20806/online-payment-market-q1-2017/.

China Internet Watch. (2017c). *Top hotel booking mobile apps in China in March 2017*. Retrieved December 12, 2017, from https://www.chinainternetwatch.com/20489/top-hotel-booking-mobile-apps-mar-2017/.

China Internet Watch Team. (2015). *China e-payment reached $86.17 trillion in Q3 2015*. Retrieved May 23, 2018, from http://www.chinainternetwatch.com/16099/china-e-payment-q3-2015/.

China Mobile Internet Report. (2014). *China mobile Internet report*. Retrieved December 12, 2017, from https://www.cnnic.cn/hlwfzyj/hlwxzbg/201408/P020140826366265178976.pdf.

China UnionPay. (2016a). *China UnionPay collaborates with China telecom to develop mobile payment*. Retrieved December 12, 2017, from http://en.unionpay.com/news/newsroom/file_50670631.html.

China UnionPay. (2016b). *Overview*. Retrieved December 12, 2017, from http://en.unionpay.com/comInstr/aboutUs/file_4912292.html.

Chiou, W. C., Lin, C. C., & Perng, C. (2010). A strategic framework for website evaluation based on a review of the literature from 1995–2006. *Information & Management, 47*(5), 282-290.

Chiou, W. C., Lin, C. C., & Perng, C. (2011). A strategic website evaluation of online travel agencies. *Tourism Management, 32*(6), 1463-1473.

Chong, A. Y. L., Chan, F. T., & Ooi, K. B. (2012). Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. *Decision Support Systems, 53*(1), 34-43.

Chung, T., & Law, R. (2003). Developing a performance indicator for hotel websites. *International Journal of Hospitality Management, 22*(1), 119-125.

Commeasure. (2014). *Hotel bookings surge on mobile - Is your hotel ready? lessons from China and India.* Retrieved December 12, 2017, from http://www.commeasure.com/blog/hotel-bookings-on-mobile-lessons-from-china-and-what-it-could-mean-for-indian-hoteliers.

comScore. (2012). *Smart travel: majority of smartphone owners now access travel information on their devices*. Retrieved October 20, 2017, from

http://www.comscore.com/Insights/Press-Releases/2012/4/Majority-of-Smartphone-Owners-Now-Access-Travel-Information-on-their-Devices?cs_edgescape_cc=HK.

comScore. (2013). *2013 U.S. digital future in focus report*. Retrieved December 12, 2017, from http://www.comscore.com/Insights/Press-Releases/2013/2/comScore-Releases-the-2013-U.S.-Digital-Future-in-Focus-Report.

Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: a review and avenues for further research. *Journal of Applied Social Psychology, 28*(15), 1429-1464.

Crawford-Welch, S., & McCleary, K. W. (1992). An identification of the subject areas and research techniques used in five hospitality-related journals. *International Journal of Hospitality Management, 11*(2), 155-167.

Credit Union National Association. (2013). *CUNA survey: most smartphone users make mobile payments*. Retrieved December 12, 2017, from http://www.cuna.org/Stay-Informed/News-Now/CU-System/CUNA-Survey–Most-Smartphone-Users-Make-Mobile-Payments/.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

CyberSource. (2015). *AliPay international services*. Retrieved May 24, 2018, from http://apps.cybersource.com/library/documentation/dev_guides/AliPayInt/AliPay_Int_SO_API.pdf.

Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: a literature review. *Electronic Commerce Research and Applications, 7*(2), 165-181.

de Kerviler, G., Demoulin, N. T., & Zidda, P. (2016). Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *Journal of Retailing and Consumer Services, 31*, 334-344.

de Reuver, M., & Ondrus, J. (2017). When technological superiority is not enough: The struggle to Impose the SIM card as the NFC secure element for mobile payment platforms. *Telecommunications Policy, 41*(4), 253-262.

DeFranco, A., & Morosan, C. (2017). Coping with the risk of internet connectivity in hotels: perspectives from American consumers traveling internationally. *Tourism Management, 61*, 380-393.

Del Rey, J. (2016). *Apple Pay's launch in China was three times bigger than in U.S.* Retrieved December 12, 2017, from http://recode.net/2016/03/21/apple-pays-launch-in-china-was-three-times-bigger-than-in-u-s/.

DeLuna, J. (2014). *Survey: Half of travelers 'definitely' would use mobile payments*. Retrieved December 12, 2017, from http://www.businesstravelnews.com/Expense-Management/Survey-Half-Of-Travelers-Definitely-Would-Use-Mobile-Payments?ida=Technology&a=mgmt.

Diatmika, I. W. B., Irianto, G., & Baridwan, Z. (2016). Determinants of behavior intention of accounting information systems based information technology acceptance. *Imperial Journal of Interdisciplinary Research, 2*(8), 125-138.

Díaz, E., & Koutra, C. (2013). Evaluation of the persuasive features of hotel chains websites: a latent class segmentation analysis. *International Journal of Hospitality Management, 34*, 338-347.

Dickinson, J. E., Ghali, K., Cherrett, T., Speed, C., Davies, N., & Norgate, S. (2014). Tourism and the smartphone app: Capabilities, emerging practice and scope in the travel domain. *Current Issues in Tourism, 17*(1), 84-101.

Dion, C. P., & Woodside, A. G. (2010). Usefulness of government and private destination websites. In A. G. Woodside (Ed.), *Advances in Culture, Tourism and Hospitality Research* (pp. 69-137). Bingley, UK: Emerald Group Publishing Limited.

DiPietro, R. B., & Peterson, R. (2017). Exploring cruise experiences, satisfaction, and loyalty: The case of Aruba as a small-island tourism economy. *International Journal of Hospitality & Tourism Administration, 18*(1), 41-60.

Doosti, S., Jalilvand, M. R., Asadi, A., Khazaei Pool, J., & Mehrani Adl, P. (2016). Analyzing the influence of electronic word of mouth on visit intention: the mediating role of tourists' attitude and city image. *International Journal of Tourism Cities, 2*(2), 137-148.

Elbeltagi, I., & Agag, G. (2016). E-retailing Ethics and its impact on customer satisfaction and repurchase intention: A cultural and commitment-trust theory perspective. *Internet Research, 26*(1), 288-310.

eMarker. (2014). *Asia-Pacific boasts more than 1 billion smartphone users*. Retrieved December 12, 2017, from http://www.emarketer.com/Article/Asia-Pacific-Boasts-More-Than-1-Billion-Smartphone-Users/1012984.

Engel, J. F., Blackwell, R. D., & Miniard, P. W. (1990). *Consumer Behaviour*. Hinsdale, IL: Dryden Press.

Eriksson, N. (2014). User categories of mobile travel services. *Journal of Hospitality and Tourism Technology, 5*(1), 17-30.

Essawy, M. (2005). Exploring the presence and exploitation of e-relationship marketing by UK based multi-unit hotel brands. In A. J. Frew (Ed.), *Information and Communication Technologies in Tourism 2005* (pp. 338-349). New York, NY: Springer-Verlag.

Evans, J. R., & King, V. E. (1999). Business-to-business marketing and the world wide web: Planning, managing, and assessing web sites. *Industrial Marketing Management, 28*(4), 343-358.

Falk, T., Kunz, W. H., Schepers, J. J., & Mrozek, A. J. (2016). How mobile payment influences the overall store price image. *Journal of Business Research, 69*(7), 2417-2423.

Fan, J., Shao, M., Li, Y., & Huang, X. (2018). Understanding users' attitude toward mobile payment use: A comparative study between China and the USA. *Industrial Management & Data Systems, 118*(3), 524-540.

Feng, R., Morrison, A. M., & Ismail, J. A. (2004). East versus west: a comparison of online destination marketing in China and the USA. *Journal of Vacation Marketing, 10*(1), 43-56.

Fernández-Cavia, J., Rovira, C., Díaz-Luque, P., & Cavaller, V. (2014). Web Quality Index (WQI) for official tourist destination websites: proposal for an assessment system. *Tourism Management Perspectives, 9*, 5-13.

Finance Magnates. (2014). *WeChat now supports payments between users and one-click payments*. Retrieved April 29, 2016, from http://www.financemagnates.com/fintech/payments/wechat-now-supports-payments-between-users-and-one-click-payments/.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Reading, MA: Addison-Wesley.

Fong, L. H. N., Lam, L. W., & Law, R. (2017). How locus of control shapes intention to reuse mobile apps for making hotel reservations: Evidence from Chinese consumers. *Tourism Management, 61*, 331-342.

Fornell, C., & Larcker, D. F. (1981a). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50.

Fornell, C., & Larcker, D. F. (1981b). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research, 18*(3), 382-388.

Forrester Research. (2013). *Smartphones vs. tablets: forrester reveals the differences*. Retrieved May 23, 2018, from http://www.monetate.com/blog/smartphones-vs-tablets-forrester-reveals-the-differences/.

Fuld, L. M. (1996). Will today's databases survive? *Information Today, 12*(1), 21-23.

Gao, S., Yang, X., Guo, H., & Jing, J. (2018). An Empirical Study on Users' Continuous Usage Intention of QR Code Mobile Payment Services in China. *International Journal of E-Adoption (IJEA), 10*(1), 18-33.

Ghezzi, A., Renga, F., Balocco, R., & Pescetto, P. (2010). Mobile payment applications: offer state of the art in the Italian market. *Info: the Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media, 12*(5), 3-22.

Giannopoulos, A. A., & Mavragani, E. P. (2011). Traveling through the Web: a first step toward a comparative analysis of European national tourism websites. *Journal of Hospitality Marketing & Management, 20*(7), 718-739.

Gilbert, D., & Powell-Perry, J. (2001). Exploring developments in Web based relationship marketing within the hotel industry. *Journal of Hospitality & Leisure Marketing, 9*(3-4), 141-159.

Golmohammadi, A., Jahandideh, B., & O'gorman, K. (2012). Booking on-line or not: a decision rule approach. *Tourism Management Perspectives, 2*, 85-88.

Gonzalo, F. (2016). *16 Statistics about mobile travel in 2016*. Retrieved December 12, 2017, from https://ehotelier.com/insights/2016/04/15/16-stats-mobile-travel-2016/.

Google. (2013). *The 2013 traveler*. Retrieved December 12, 2017, from http://sete.gr/_fileuploads/entries/Online%20library/GR/131126_The%202013%20Traveler.pdf.

Google Developers. (2015). *Mobile friendly websites*. Retrieved May 23, 2018, from https://developers.google.com/webmasters/mobile-sites/mobile-seo/.

Google Wallet. (2016). *Android Pay & Google wallet*. Retrieved December 12, 2017, from https://www.google.com.hk/wallet/faq/.

Gretzel, U. (2011). Intelligent systems in tourism: A social science perspective. *Annals of Tourism Research, 38*(3), 757-779.

Gretzel, U., Yuan, Y. L., & Fesenmaier, D. R. (2000). Preparing for the new economy: Advertising strategies and change in destination marketing organizations. *Journal of Travel Research, 39*(2), 146-156.

Grönroos, C., & Voima, P. (2013). Critical service logic: making sense of value creation and co-creation. *Journal of the Academy of Marketing Science, 41*(2), 133-150.

Grüschow, R. M., & Brettel, M. (2018). Managing payment transaction costs at multinational online retailers. *International Journal of Electronic Commerce, 22*(1), 125-157.

Gupta, G., & Dhariwal, S. (2017). Secure online payment approch using postern algorithm. *International Journal of Computer Applications, 167*(14), 30-36.

Ha, K. H., Canedoli, A., Baur, A. W., & Bick, M. (2012). Mobile banking—insights on its increasing relevance and most common drivers of adoption. *Electronic Markets, 22*(4), 217-227.

Hahn, S. E., Sparks, B., Wilkins, H., & Jin, X. (2017). E-service quality management of a hotel website: a scale and implications for management. *Journal of Hospitality Marketing & Management, 26*(7), 694-716.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Ham, S. (2004). Developing a content analysis evaluation approach for the examination of limited-service lodging properties. *Journal of Travel & Tourism Marketing, 17*(2-3), 295-308.

Han, H. (2015). Travelers' pro-environmental behavior in a green lodging context: Converging value-belief-norm theory and the theory of planned behavior. *Tourism Management, 47*, 164-177.

Han, H., Hsu, L. T., & Sheu, C. (2010). Application of the theory of planned behavior to green hotel choice: testing the effect of environmental friendly activities. *Tourism Management, 31*(3), 325-334.

Han, J. H., & Mills, J. E. (2006). Zero acquaintance benchmarking at travel destination websites: what is the first impression that national tourism organizations try to make? *International Journal of Tourism Research, 8*(6), 405-430.

Hanai, T., & Oguchi, T. (2008). Features of lodging information in promotion of reservation through the Internet: what kind of lodgings are popular in Shinjuku? *Asia Pacific Journal of Tourism Research, 13*(1), 33-40.

Hao, J. X., Yu, Y., Law, R., & Fong, D. K. C. (2015). A genetic algorithm-based learning approach to understand customer satisfaction with OTA websites. *Tourism Management, 48*, 231-241.

Harison, E., & Boonstra, A. (2008). Reaching new altitudes in e-commerce: Assessing the performance of airline websites. *Journal of Air Transport Management, 14*(2), 92-98.

Hassan, S., & Li, F. (2005). Evaluating the usability and content usefulness of web sites: a benchmarking approach. *Journal of Electronic Commerce in Organisations, 3*(2), 46-67.

He, Q., Duan, Y., Fu, Z., & Li, D. (2006). An innovation adoption study of online e-payment in Chinese companies. *Journal of Electronic Commerce in Organizations (JECO), 4*(1), 48-69.

Henderson, K. A. (2011). Post-positivism and the pragmatics of leisure research. *Leisure Sciences, 33*(4), 341-346.

Henkel, J. (2002). Mobile payment. *Mobile commerce* (pp. 327-351). Gabler Verlag, Germany: Springer.

Higgs, J., Horsfall, D., & Grace, S. (2009). *Writing qualitative research on practice*. Rotterdam, The Netherlands: Sense Publishers.

Ho, C. I., & Lee, Y. L. (2007). The development of an e-travel service quality scale. *Tourism Management, 28*(6), 1434-1449.

Ho, J. K. (1997). Evaluating the World Wide Web: A global study of commercial sites. *Journal of Computer-Medicated Communication, 3*(1), 1-12.

Höpken, W., Fuchs, M., Zanker, M., & Beer, T. (2010). Context-based adaptation of mobile applications in tourism. *Information Technology & Tourism, 12*(2), 175-195.

Hospitalitynet. (2016). *What hoteliers can do to leverage mobile hotel booking trends*. Retrieved May 23, 2018, from http://www.hospitalitynet.org/news/4074180.html.

Hotel Online. (2015). *Mobile payments: the new expectation for hotels*. Retrieved May 17, 2018, from http://www.hotel-online.com/press_releases/release/mobile-payments-the-new-expectation-for-hotels?utm_medium=email&utm_source=Offer&utm_campaign=10-15-2015.

Hoyer, W. D. (1984). An examination of consumer decision making for a common repeat purchase product. *Journal of Consumer Research, 11*(3), 822-829.

Hsieh, C. (2001). E-commerce payment systems: critical issues and management strategies. *Human Systems Management, 20*(2), 131-138.

Hsu, C. H., & Huang, S. S. (2012). An extension of the theory of planned behavior model for tourists. *Journal of Hospitality & Tourism Research, 36*(3), 390-417.

Hu, L., & Bentler, P. (1996). Fit indices in covariance structural equation modeling. *Psychological Methods, 3*, 424-453.

Hui, K. L., Teo, H. H., & Lee, S. Y. T. (2007). The value of privacy assurance: an exploratory field experiment. *MIS Quarterly, 31*(1), 19-33.

InvestingAnswers. (2016). *Person-to-Person payments (P2P)*. Retrieved December 12, 2017, from http://www.investinganswers.com/financial-dictionary/personal-finance/person-person-payments-p2p-2584.

Ip, C., Law, R., & Lee, H. A. (2011). A review of website evaluation studies in the tourism and hospitality fields from 1996 to 2009. *International Journal of Tourism Research, 13*(3), 234-265.

Ip, C., Lee, H., & Law, R. (2010). Profiling the users of travel websites for planning and online experience sharing. *Journal of Hospitality & Tourism Research, 36*(3), 418-426.

Isaid, E. N., & Faisal, M. N. (2015). Consumers' repurchase intention towards a mobile phone brand in Qatar: an exploratory study utilizing theory of reasoned action framework. *Global Business Review, 16*(4), 594-608.

Ismail, J. A., Labropoulos, T., Mills, J. E., & Morrison, A. M. (2002). A snapshot in time: The marketing of culture in European Union NTO Websites. *Tourism, Culture & Communication, 3*(3), 165-179.

Jahng, J. J., Jain, H., & Ramamurthy, K. (2000). Effective design of electronic commerce environment: a proposed theory of congruence and an illustration. *IEEE Transactions on Systems, Man, and Cybernetices - Part A: Systems and Humans, 30*(4), 456-471.

Jarvis, D., Stoeckl, N., & Liu, H. B. (2016). The impact of economic, social and environmental factors on trip satisfaction and the likelihood of visitors returning. *Tourism Management, 52*, 1-18.

Jeong, M., & Lambert, C. U. (2001). Adaptation of an information quality framework to measure customers' behavioral intentions to use lodging Web sites. *International Journal of Hospitality Management, 20*(2), 129-146.

Jeong, M., Oh, H., & Gregoire, M. (2003). Conceptualizing Web site quality and its consequences in the lodging industry. *International Journal of Hospitality Management, 22*(2), 161-175.

Jin, C. (2014). *Mobile web usage exceeds PC for the first time*. Retrieved December 12, 2017, from http://en.ce.cn/Insight/201408/14/t20140814_3355971.shtml.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard–measures that drive performance. *Harvard Business Review*(January/February), 71-79.

Kaplan, R. S., & Norton, D. P. (1993). Putting the balanced scorecard to work. *Harvard Business Review*(September/October), 134-142.

Kaplan, S., Manca, F., Nielsen, T. A. S., & Prato, C. G. (2015). Intentions to use bike-sharing for holiday cycling: An application of the theory of planned behavior. *Tourism Management, 47*, 34-46.

Kaplanidou, K., & Vogt, C. (2006). A structural analysis of destination travel intentions as a function of web site features. *Journal of Travel Research, 45*(2), 204-216.

Karnouskos, S. (2004). Mobile payment: a journey through existing procedures and standardization initiatives. *IEEE Communications Surveys & Tutorials, 6*(4), 44-66.

Katz, J. E., & Sugiyama, S. (2006). Mobile phones as fashion statements: evidence from student surveys in the US and Japan. *New Media & Society, 8*(2), 321-337.

Kelle, U. (2006). Combining qualitative and quantitative methods in research practice: purposes and advantages. *Qualitative Research in Psychology, 3*(4), 293-311.

Khan, I., & Rahman, Z. (2017). Development of a scale to measure hotel brand experiences. *International Journal of Contemporary Hospitality Management, 29,* 268-287.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior, 26*(3), 310-322.

Kim, D. Y., Morrison, A. M., & Mills, J. E. (2004). Tiers or tears? An evaluation of the web-based marketing efforts of major city convention centers in the US. *Journal of Convention & Exhibition Management, 5*(2), 25-49.

Kim, D. Y., Park, J., & Morrison, A. M. (2008). A model of traveller acceptance of mobile technology. *International Journal of Tourism Research, 10*(5), 393-407.

Kim, H., Kim, T. T., & Shin, S. W. (2009a). Modeling roles of subjective norms and eTrust in customers' acceptance of airline B2C eCommerce websites. *Tourism Management, 30*(2), 266-277.

Kim, H. H., & Kim, Y. H. (2008). Usability study of digital institutional repositories. *The Electronic Library, 26*(6), 863-881.

Kim, M. J., Chung, N., Lee, C. K., & Preis, M. W. (2015). Motivations and use context in mobile tourism shopping: applying contingency and task–technology fit theories. *International Journal of Tourism Research, 17*(1), 13-24.

Kim, S. Y., & Lim, Y. J. (2001). Consumers' perceived importance of and satisfaction with Internet shopping. *Electronic Markets, 11*(3), 148-154.

Kim, T. T., Kim, W. G., & Kim, H. B. (2009b). The effects of perceived justice on recovery satisfaction, trust, word-of-mouth, and revisit intention in upscale hotels. *Tourism Management, 30*(1), 51-62.

Kim, W. G., Kim, T., Gazzoli, G., Park, Y., Kim, S. H., & Park, S. S. (2011). Factors affecting the travel expenditure of visitors to Macau, China. *Tourism Economics, 17*(4), 857-883.

Kim, W. G., & Lee, H. Y. (2004). Comparison of Web service quality between online travel agencies and online travel suppliers. *Journal of Travel & Tourism Marketing, 17*(2-3), 105-116.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford publications.

Knutson, B., Stevens, P., Wullaert, C., Patton, M., & Yokoyama, F. (1990). LODGSERV: A service quality index for the lodging industry. *Journal of Hospitality & Tourism Research, 14*(2), 277-284.

Kotler, P., Bowen, J., & Makens, J. (2003). *Marketing for hospitality and tourism*. New York, NY: Prentice Hal.

Ladhari, R. (2010). Developing e-service quality scales: A literature review. *Journal of Retailing and Consumer Services, 17*(6), 464-477.

Ladhari, R., & Michaud, M. (2015). eWOM effects on hotel booking intentions, attitudes, trust, and website perceptions. *International Journal of Hospitality Management, 46*, 36-45.

Lai, I. K. W. (2013). Traveler Acceptance of an App-Based Mobile Tour Guide. *Journal of Hospitality & Tourism Research, 39*(3), 401-432.

Lam, T., & Hsu, C. H. (2004). Theory of planned behavior: potential travelers from China. *Journal of Hospitality & Tourism Research, 28*(4), 463-482.

Lam, T., & Hsu, C. H. (2006). Predicting behavioral intention of choosing a travel destination. *Tourism Management, 27*(4), 589-599.

Lamsfus, C., Wang, D., Alzua-Sorzabal, A., & Xiang, Z. (2015). Going mobile defining context for on-the-go travelers. *Journal of Travel Research, 54*(6), 691-701.

Lau, A. L., & McKercher, B. (2004). Exploration versus acquisition: A comparison of first-time and repeat visitors. *Journal of Travel Research, 42*(3), 279-285.

Law, R. (2018). Evaluation of Hotel Websites: Progress and Future Developments. *International Journal of Hospitality Management*. In press.

Law, R., Buhalis, D., & Cobanoglu, C. (2014). Progress on information and communication technologies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 26*(5), 727-750.

Law, R., Chan, I., & Goh, C. (2007). Where to find the lowest hotel room rates on the internet? The case of Hong Kong. *International Journal of Contemporary Hospitality Management, 19*(6), 495-506.

Law, R., & Cheung, C. (2005). Benchmarking and quantitative evaluation of the functionality performance of hotel websites: a study of the Hong Kong special administrative region of China. *China Tourism Research, 1*(1), 101-115.

Law, R., & Hsu, C. H. C. (2005). Customers' perceptions on the importance of hotel Web site dimensions and attributes. *International Journal of Contemporary Hospitality Management, 17*(6), 493-503.

Law, R., & Hsu, C. H. C. (2006). Importance of hotel website dimensions and attributes: perceptions of online browsers and online purchasers. *Journal of Hospitality & Tourism Research, 30*(3), 295-312.

Law, R., Qi, S., & Buhalis, D. (2010). Progress in tourism management: A review of website evaluation in tourism research. *Tourism Management, 31*(3), 297-313.

Law, R., Qi, S., & Leung, B. (2008). Perceptions of functionality and usability on travel websites: The case of Chinese travelers. *Asia Pacific Journal of Tourism Research, 13*(4), 435-445.

Lee, D., Moon, J., Kim, Y. J., & Mun, Y. Y. (2015). Antecedents and consequences of mobile phone usability: linking simplicity and interactivity to satisfaction, trust, and brand loyalty. *Information & Management, 52*(3), 295-304.

Leposa, A. (2012). *Friendsourcing: guest apps get personal*. Retrieved December 12, 2017, from www.hotelmanagement.net.

Leung, R., Rong, J., Li, G., & Law, R. (2013). Personality differences and hotel Web design study using targeted positive and negative association rule mining. *Journal of Hospitality Marketing & Management, 22*(7), 701-727.

Li, G., Elliot, S., & Choi, C. (2010). Electronic word-of-mouth in B2C virtual communities: an empirical study from Ctrip. com. *Journal of Global Academy of Marketing, 20*(3), 262-268.

Li, L., Peng, M., Jiang, N., & Law, R. (2017). An empirical study on the influence of economy hotel website quality on online booking intentions. *International Journal of Hospitality Management, 63*, 1-10.

Li, X., & Wang, Y. (2011). Measuring the effectiveness of US official state tourism websites. *Journal of Vacation Marketing, 17*(4), 287-302.

Li, X., Wang, Y., & Yu, Y. (2015). Present and future hotel website marketing activities: Change propensity analysis. *International Journal of Hospitality Management, 47*, 131-139.

Liang, L. J., Choi, H. C., & Joppe, M. (2017). Understanding repurchase intention of Airbnb consumers: perceived authenticity, electronic word-of-mouth, and price sensitivity. *Journal of Travel & Tourism Marketing*, 1-17. doi:10.1080/10548408.2016.1224750.

Liao, C., Chen, J. L., & Yen, D. C. (2007). Theory of planning behavior (TPB) and customer satisfaction in the continued use of e-service: An integrated model. *Computers in Human Behavior, 23*(6), 2804-2822.

Liébana-Cabanillas, F., Muñoz-Leiva, F., & Sánchez-Fernández, J. (2017). A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment. *Service Business*, 1-40. doi:10.1007/s11628-017-0336-7.

Liébana-Cabanillas, F., Muñoz-Leiva, F., & Sánchez-Fernández, J. (2018). A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment. *Service Business, 12*(1), 25-64.

Liska, A. E. (1984). A critical examination of the causal structure of the Fishbein/Ajzen attitude-behavior model. *Social Psychology Quarterly, 47*(1), 61-74.

Liu, C., Arnett, K. P., & Litecky, C. (2000). Design quality of websites for electronic commerce: fortune 1000 webmasters' evaluations. *Electronic Markets, 10*(2), 120-129.

Liu, C. R., Lin, W. R., & Wang, Y. C. (2012). Relationship between self-congruity and destination loyalty: differences between first-time and repeat visitors. *Journal of Destination Marketing & Management, 1*(1), 118-123.

Llodrà-Riera, I., Martínez-Ruiz, M. P., Jiménez-Zarco, A. I., & Izquierdo-Yusta, A. (2015). A multidimensional analysis of the information sources construct and its relevance for destination image formation. *Tourism Management, 48*, 319-328.

Lowry, P. B., Wells, T. M., Moody, G. D., Humphreys, S., & Kettles, D. (2006). Online payment gateways used to facilitate e-commerce transactions and improve risk management. *Communications of the Association for Information Systems (CAIS), 17*(6), 1-48.

Lu, J., Yao, J. E., & Yu, C. S. (2005). Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *The Journal of Strategic Information Systems, 14*(3), 245-268.

Lu, M., & Yeung, W. (1998). A framework for effective commercial web application development. *Internet Research, 8*(2), 166-173.

Lu, Y., Yang, S., Chau, P. Y., & Cao, Y. (2011). Dynamics between the trust transfer process and intention to use mobile payment services: A cross-environment perspective. *Information & Management, 48*(8), 393-403.

Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in Human Behavior, 25*(1), 29-39.

Mao, Z., & Lyu, J. (2017). Why travelers use Airbnb again? An integrative approach to understanding travelers' repurchase intention. *International Journal of Contemporary Hospitality Management, 29*(9), 2464-2482.

Marcussen, C. H. (2008). *Trends in European internet distributiobn of travel and tourism services*. Retrieved August 7, 2017, from http://www.crt.dk/uk/staff/chm/Martrends.htm.

Maswera, T., Dawson, R., & Edwards, J. (2008). E-commerce adoption of travel and tourism organisations in South Africa, Kenya, Zimbabwe and Uganda. *Telematics and Informatics, 25*(3), 187-200.

Mathieson, K. (1991). Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research, 2*(3), 173-191.

Mauri, A. G., & Minazzi, R. (2013). Web reviews influence on expectations and purchasing intentions of hotel potential customers. *International Journal of Hospitality Management, 34*, 99-107.

Metzger, M. J. (2006). Effects of site, vendor, and consumer characteristics on web site trust and disclosure. *Communication Research, 33*(3), 155-179.

Meunler, B. (2012). *16 differences between Google mobile & desktop search results in 2012*. Retrieved December 12, 2017, from http://searchengineland.com/16-differences-between-google-mobile-desktop-search-results-in-2012-130463.

Mittal, V., & Kamakura, W. A. (2001). Satisfaction, repurchase intent, and repurchase behavior: Investigating the moderating effect of customer characteristics. *Journal of Marketing Research, 38*(1), 131-142.

Morosan, C. (2015). An empirical analysis of intentions to cocreate value in hotels using mobile devices. *Journal of Hospitality & Tourism Research*, 1-35. doi:10.1177/1096348015597034.

Morosan, C., & DeFranco, A. (2015). Disclosing personal information via hotel apps: A privacy calculus perspective. *International Journal of Hospitality Management, 47*, 120-130.

Morosan, C., & DeFranco, A. (2016). It's about time: Revisiting UTAUT2 to examine consumers' intentions to use NFC mobile payments in hotels. *International Journal of Hospitality Management, 53*, 17-29.

Morrison, A. M., Taylor, J. S., & Douglas, A. (2004). Website evaluation in tourism and hospitality. *Journal of Travel & Tourism Marketing, 17*(2-3), 233-251.

Morrison, A. M., Taylor, J. S., Morrison, A. J., & Morrison, A. D. (1999). Marketing small hotels on the world wide web. *Information Technology & Tourism, 2*(2), 97-113.

Mothersbaugh, D. L., Foxx, W. K., Beatty, S. E., & Wang, S. (2011). Disclosure antecedents in an online service context: the role of sensitivity of information. *Journal of Service Research, 15*(1), 76-98.

Moutinho, L. (1987). Consumer behaviour in tourism. *European Journal of Marketing, 21*(10), 5-44.

Murphy, H. C., Chen, M. M., & Cossutta, M. (2016). An investigation of multiple devices and information sources used in the hotel booking process. *Tourism Management, 52*, 44-51.

Murphy, J., Forrest, E. J., Wotring, C. E., & Brymer, R. A. (1996). Hotel management and marketing on the Internet. *Cornell Hotel & Restaurant Administration Quarterly, 37*(3), 70-77.

Murphy, L., Moscardo, G., Benckendorff, P., & Pearce, P. (2011). Evaluating tourist satisfaction with the retail experience in a typical tourist shopping village. *Journal of Retailing and Consumer Services, 18*(4), 302-310.

Musante, M., Bojanic, D., & Zhang, J. (2008). A modified brand personality scale for the restaurant industry. *Journal of Hospitality Marketing & Management, 16*(4), 303-323.

Nielsen, J. (1993). *Usability engineering*. Cambridge, MA: Academic Press.

Nielsen, J. (2000). *Designing Web usability: The practice of simplicity*. Indianapolis, Indiana, USA: New Riders.

Nielsen, J. (2003). *Usability 101*. Retrieved December 12, 2017, from http://www.useit.com/alertbox/20030825.html.

Nunnally, J. (1978). *Psychometric theory*. New York, USA: McGraw-Hill.

Oh, H., Oh, H., Kim, K., & Kim, K. (2017). Customer satisfaction, service quality, and customer value: years 2000-2015. *International Journal of Contemporary Hospitality Management, 29*(1), 2-29.

Oh, S., Lehto, X. Y., & Park, J. (2009). Travelers' intent to use mobile technologies as a function of effort and performance expectancy. *Journal of Hospitality Marketing & Management, 18*(8), 765-781.

Okazaki, S., Campo, S., Andreu, L., & Romero, J. (2014). A latent class analysis of Spanish travelers' mobile Internet usage in travel planning and execution. *Cornell Hospitality Quarterly, 56*(2), 191-201.

Okumus, B., Bilgihan, A., & Ozturk, A. B. (2015). Factors affecting the acceptance of smartphone diet applications. *Journal of Hospitality Marketing & Management, 25*(6), 726-747.

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior, 61*, 404-414.

Oliver, R. L. (1981). Measurement and evaluation of satisfaction processes in retail settings. *Journal of Retailing, 57*(3), 25-48.

Otondo, R. F., Scotter, J. R. V., Allen, G. D., & Palvia, P. (2008). The complexity of richness: media, message, and communication outcomes. *Information & Management, 45*(1), 21-30.

Ozturk, A. B., Bilgihan, A., Nusair, K., & Okumus, F. (2016). What keeps the mobile hotel booking users loyal? Investigating the roles of self-efficacy, compatibility, perceived ease of use, and perceived convenience. *International Journal of Information Management, 36*(6), 1350-1359.

Panagopoulos, A., Kanellopoulos, D., Karachanidis, I., & Konstantinidis, S. (2011). A comprehensive evaluation framework for hotel websites: The case of chain hotel websites operating in Greece. *Journal of Hospitality Marketing & Management, 20*(7), 695-717.

Panhwar, A. H., Ansari, S., & Shah, A. A. (2017). Post-positivism: an effective paradigm for social and educational research. *International Research Journal of Arts & Humanities (IRJAH), 45*(45), 253-260.

Pansari, A., & Kumar, V. (2017). Customer engagement: the construct, antecedents, and consequences. *Journal of the Academy of Marketing Science, 45*(3), 294-311.

Papadimitriou, D., Kaplanidou, K. K., & Apostolopoulou, A. (2015). Destination image components and word-of-mouth intentions in urban tourism a multigroup approach. *Journal of Hospitality & Tourism Research*, 1-25. doi:10.1177/1096348015584443.

Parasuraman, A., & Grewal, D. (2000). The impact of technology on the quality-value-loyalty chain: a research agenda. *Journal of the Academy of Marketing Science, 28*(1), 168-174.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). Servqual. *Journal of Retailing, 64*(1), 12-40.

Park, C. H., & Kim, Y. G. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. *International Journal of Retail & Distribution Management, 31*(1), 16-29.

Park, K., Phillips, W. J., Canter, D. D., & Abbott, J. (2011). Hospitality and tourism research rankings by author, university, and country using six major journals. *Journal of Hospitality & Tourism Research, 35*(3), 381-416.

Park, S., & Huang, Y. (2017). Motivators and inhibitors in booking a hotel via smartphones. *International Journal of Contemporary Hospitality Management, 29*(1), 161-178.

Park, S. H., Hsieh, C. M., & Lee, C. K. (2017). Examining Chinese college students' intention to travel to Japan using the extended theory of planned behavior: testing destination image

and the mediating role of travel constraints. *Journal of Travel & Tourism Marketing, 34*(1), 113-131.

Park, Y. A., & Gretzel, U. (2007). Success factors for destination marketing web sites: A qualitative meta-analysis. *Journal of Travel Research, 46*(1), 46-63.

Park, Y. A., Gretzel, U., & Sirakaya-Turk, E. (2007). Measuring web site quality for online travel agencies. *Journal of Travel & Tourism Marketing, 23*(1), 15-30.

Pavlou, P. A., & Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS Quarterly*, 115-143.

Payments. (2016). *Huawei launches Huawei Pay with China UnionPay*. Retrieved December 12, 2017, from http://www.paymentscardsandmobile.com/huawei-launches-huawei-pay-china-unionpay/.

Paypal. (2016). *Instant payment notification*. Retrieved December 12, 2017, from https://developer.paypal.com/webapps/developer/docs/classic/products/instant-payment-notification/.

Perdue, R. (2001). Internet site evaluations: The influence of behavioral experience, existing images, and selected Website characteristics. *Journal of Travel & Tourism Marketing, 11*(2/3), 21-38.

Perdue, R. R. (2002). Internet site evaluations: the influence of behavioral experience, existing images, and selected website characteristics. *Journal of Travel & Tourism Marketing, 11*(2-3), 21-38.

Pereira, H. G., de Fátima Salgueiro, M., & Rita, P. (2017). Online determinants of e-customer satisfaction: application to website purchases in tourism. *Service Business, 11*(2), 375-403.

Peres, R., Correia, A., & Moital, M. (2011). The indicators of intention to adopt mobile electronic tourist guides. *Journal of Hospitality and Tourism Technology, 2*(2), 120-138.

Perez, B. (2015). *China has more smartphone users than US, Brazil, and Indonesia combined*. *South China Morning Post.* Retrieved December 12, 2017, from http://www.businessinsider.com/china-has-more-smartphone-users-than-us-brazil-and-indonesia-combined-2015-7.

Phelps, J., Nowak, G., & Ferrell, E. (2000). Privacy concerns and consumer willingness to provide personal information. *Journal of Public Policy & Marketing, 19*(1), 27-41.

Phocuswright. (2017). *China leads in mobile travel bookings*. Retrieved December 12, 2017, from http://www.phocuswright.com/Travel-Research/Research-Updates/2016/China-Leads-in-Mobile-Travel-Bookings.

Prayag, G., & Ryan, C. (2011). The relationship between the 'push' and 'pull' factors of a tourist destination: the role of nationality – an analytical qualitative research approach. *Current Issues in Tourism, 14*(2), 121-143.

Qi, S., Law, R., & Buhalis, D. (2008). Usability of Chinese destination management organization websites. *Journal of Travel & Tourism Marketing, 25*(2), 182-198.

Quah, M. L. (2016). *Asia-Pacific mobile payments market to surpass US$271bil by 2021*. Retrieved December 20, 2017, from https://www.linkedin.com/pulse/asia-pacific-mobile-payments-market-surpass-us271bil-2021-quah.

Rachman, Z., & Richins, H. (1997). The status of New Zealand tour operator Web sites. *Journal of Tourism Studies, 8*(2), 62-77.

Rahimi, R., & Kozak, M. (2017). Impact of customer relationship management on customer satisfaction: The case of a budget hotel chain. *Journal of Travel & Tourism Marketing, 34*(1), 40-51.

Rajendran, R., & Nair, A. V. (2017). Secure Communication in Online Payment. *International Journal of Engineering Science, 7*(5), 11457-11459.

Ranganathan, C., & Ganapathy, S. (2002). Key dimensions of business-to-consumer web sites. *Information & Management, 39*(6), 457-465.

Reddy, V. L., & Anusha, T. (2015). Combine use of steganography and visual cryptography for online payment system. *International Journal of Computer Applications, 124*(6), 7-11.

Research and Markets. (2016). *Global mobile payment methods: second half 2015*. Retrieved May 23, 2018, from http://www.researchandmarkets.com/reports/3621157/global-mobile-payment-methods-second-half-2015.

Riley, R. W., & Love, L. L. (2000). The state of qualitative tourism research. *Annals of Tourism Research, 27*(1), 164-187.

Ryan, A. B. (2006). Post-positivist approaches to research. *Researching and Writing your Thesis: a guide for postgraduate students*. MACE: Maynooth Adult and Community Education.

Salavati, S., & Hashim, N. H. (2015). Website adoption and performance by Iranian hotels. *Tourism Management, 46*, 367-374.

Samsung Newsroom. (2016). *Samsung Pay is now available in China with China Union Pay*. Retrieved December 12, 2017, from https://news.samsung.com/global/samsung-pay-is-now-available-in-china-with-china-union-pay.

Santos, J. R. A. (1999). Cronbach's alpha: a tool for assessing the reliability of scales. *Journal of Extension, 37*(2), 1-5.

Schegg, R., Stangl, B., Fux, M., & Inversini, A. (2013). *Distribution channels and management in the Swiss hotel sector*. Berlin Heidelberg, Germany: Springer.

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: investigating subjective norm and moderation effects. *Information & Management, 44*(1), 90-103.

Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications, 9*(3), 209-216.

Schlosser, A. E., White, T. B., & Lloyd, S. M. (2006). Converting Web site visitors into buyers: How Web site investment increases consumer trusting beliefs and online purchase intentions. *Journal of Marketing, 70*(2), 133-148.

Schmidt, S., Cantallops, A. S., & dos Santos, C. P. (2008). The characteristics of hotel websites and their implications for website effectiveness. *International Journal of Hospitality Management, 27*(4), 504-516.

Schüz, B., Li, A. S.-W., Hardinge, A., McEachan, R. R., & Conner, M. (2017). Socioeconomic status as a moderator between social cognitions and physical activity: Systematic review and meta-analysis based on the theory of planned behavior. *Psychology of Sport and Exercise, 30*, 186-195.

Shiau, W. L., & Luo, M. M. (2012). Factors affecting online group buying intention and satisfaction: a social exchange theory perspective. *Computers in Human Behavior, 28*(6), 2431-2444.

Siau, K., Ee-Peng, L., & Shen, Z. (2001). Mobile commerce: promises, challenges, and research agenda. *Journal of Database management, 12*(3), 4-13.

Sigala, M. (2003). Developing and benchmarking Internet marketing strategies in the hotel sector in Greece. *Journal of Hospitality & Tourism Research, 27*(4), 375-401.

Simont Braun. (2016). *Mobile wallets and mobile contactless payments – a look at NFC-technology*. Retrieved December 12, 2017, from http://www.simontbraun.eu/en/news/1956-a-look-at-nfc-technologie.

So, S., & Morrison, A. M. (2004). Internet marketing in tourism in Asia: an evaluation of the performance of east Asian national tourism organization websites. *Journal of Hospitality & Leisure Marketing, 11*(4), 93-118.

So, S. I., & Morrison, A. M. (2002). Virtually there? An evaluation of the Websites of Asian national tourism organizations. *Tourism in Asia: Development, Marketing & Sustainability: The Fifth Biennial Conference* (pp. 539-540). Hong Kong: The Hong Kong Polytechnic University.

Sojump. (2017). *Overview*. Retrieved August 24, 2017, from https://www.crunchbase.com/organization/sojump#/entity.

Sparks, B., & Pan, G. W. (2009). Chinese outbound tourists: understanding their attitudes, constraints and use of information sources. *Tourism Management, 30*(4), 483-494.

Spiliopoulou, M. (2000). Web usage mining for web site evaluation. *Communication of the ACM (Association for Computing Machinery), 43*(8), 127-134.

Springboard into China. (2016). *How to make a splash with China's online shoppers directly from your home market*. Retrieved December 12, 2017, from https://i.alipayobjects.com/i/ecmng/pdf/201409/Alipay%20-%20Springboard%20Into%20China.pdf.

Statista. (2016). *Third party mobile payment transaction volume in China from 2010 to 2018 (in billion yuan)*. Retrieved December 12, 2017, from http://www.statista.com/statistics/278528/mobile-payment-transaction-volume-in-china/.

Statista. (2017a). *Market share held by mobile operating systems in China from January 2012 to July 2017*. Retrieved December 12, 2017, from https://www.statista.com/statistics/262176/market-share-held-by-mobile-operating-systems-in-china/.

Statista. (2017b). *Number of smartphone users in China from 2013 to 2021 (in millions)*. Retrieved December 12, 2017, from https://www.statista.com/statistics/467160/forecast-of-smartphone-users-in-china/.

Stephan, F. F. (1950). Sampling. *American Journal of Sociology, 55*(4), 371-375.

Su, L., Swanson, S. R., & Chen, X. (2016). The effects of perceived service quality on repurchase intentions and subjective well-being of Chinese tourists: The mediating role of relationship quality. *Tourism Management, 52*, 82-95.

Sun, P., Cárdenas, D. A., & Harrill, R. (2016). Chinese customers' evaluation of travel website quality: a decision-tree analysis. *Journal of Hospitality Marketing & Management, 25*(4), 476-497.

Sun, P. C., & Cheng, H. K. (2007). The design of instructional multimedia in e-Learning: a media richness theory-based approach. *Computers & Education, 49*(3), 662-676.

Sun, S., Fong, D. K. C., Law, R., & He, S. (2017). An updated comprehensive review of website evaluation studies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 29*(1), 355-373.

Szymanski, D. M., & Hise, R. T. (2000). e-Satisfaction: an initial examination. *Journal of Retailing, 76*(3), 309-322.

Tang, L., Jang, S., & Morrison, A. (2012). Dual-route communication of destination websites. *Tourism Management, 33*(1), 38-49.

Tanrisevdi, A., & Duran, N. (2011). Comparative evaluation of the official destination websites from the perspective of customers. *Journal of Hospitality Marketing & Management, 20*(7), 740-765.

Tao, V. Y., Wu, A. M., Cheung, S. F., & Tong, K. K. (2011). Development of an indigenous inventory GMAB (gambling motives, attitudes and behaviors) for Chinese gamblers: an exploratory study. *Journal of Gambling Studies, 27*(1), 99-113.

Techinasia. (2014). *Starting today, Chinese consumers will be able to buy almost anything inside WeChat*. Retrieved May 23, 2018, from https://www.techinasia.com/wechat-adds-payment-support-for-brands-and-retailers.

Tencent questionaire. (2016). *Tencent questionaire*. Retrieved July 21, 2016, from http://wj.qq.com/index.html.

Thoms Sarver, V. (1983). Ajzen and Fishbein's "theory of reasoned action": A critical assessment. *Journal for the Theory of Social Behaviour, 13*(2), 155-164.

Ting, P. H., Kuo, C. F., & Li, C. M. (2012). What does hotel website content say about a property—an evaluation of upscale hotels in Taiwan and China. *Journal of Travel & Tourism Marketing, 29*(4), 369-384.

Ting, P. H., Wang, S. T., Bau, D. Y., & Chiang, M. L. (2013). Website evaluation of the top 100 hotels using advanced content analysis and eMICA model. *Cornell Hospitality Quarterly, 54*(3), 284-293.

Tnooz. (2014). *Hotel brands seeing success driving bookings via mobile apps in China*. Retrieved May 23, 2018, from https://www.tnooz.com/article/hotel-brands-seeing-success-driving-bookings-via-mobile-apps-china/.

Toh, R. S., Raven, P., & DeKay, F. (2011). Selling rooms: Hotels vs. third-party websites. *Cornell Hospitality Quarterly, 52*(2), 181-189.

Tsai, W. H., Chou, W. C., & Lai, C. W. (2010). An effective evaluation model and improvement analysis for national park websites: A case study of Taiwan. *Tourism Management, 31*(6), 936-952.

Tsang, N. K. F., Lai, M. T. H., & Law, R. (2010). Measuring e-service quality for online travel agencies. *Journal of Travel & Tourism Marketing, 27*(3), 306-323.

Tussyadiah, I. P., & Wang, D. (2014). Tourists' attitudes toward proactive smartphone systems. *Journal of Travel Research, 55*(4), 493-508.

Userfocus. (2015). *ISO-9241 Part 11: Guidance on usability*. Retrieved December 12, 2017, from http://www.userfocus.co.uk/resources/iso9241/part11.html.

Vaske, J. J., Beaman, J., & Sponarski, C. C. (2017). Rethinking internal consistency in Cronbach's alpha. *Leisure Sciences, 39*(2), 163-173.

Vermillion, L. (2010). *Service from afar*. Retrieved December 12, 2017, from http://www.lodgingmagazine.com/PastIssues/PastIssues/Service-From-Afar-1060.aspx.

Walle, A. H. (1996). Tourism and the Internet: opportunities for direct marketing. *Journal of Travel Research, 35*(1), 72-77.

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, D., & Xiang, Z. (2012). The new landscape of travel: a comprehensive analysis of smartphone apps. In M. Fuchs, F. Ricci, & L. Cantoni (Eds.), *Information and Communication Technologies in Tourism 2012* (pp. 308-319). New York, NY: Springer Wien.

Wang, D., Xiang, Z., & Fesenmaier, D. R. (2016a). Smartphone use in everyday life and travel. *Journal of Travel Research, 55*(1), 52-63.

Wang, D., Xiang, Z., Law, R., & Ki, T. P. (2016b). Assessing hotel-related smartphone apps using online reviews. *Journal of Hospitality Marketing & Management, 25*(3), 291-313.

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.

Wang, P. (2017). *Analysis: Third-party mobile payment transaction volume in China reached 1.28 billion RMB*. Retrieved December 12, 2017, from https://www.analysys.cn/analysis/22/detail/1000702/.

Wang, Y. (2008). Web-based destination marketing systems: assessing the critical factors for management and implementation. *International Journal of Tourism Research, 10*(1), 55-70.

Wang, Y. S., Li, H. T., Li, C. R., & Zhang, D. Z. (2016c). Factors affecting hotels' adoption of mobile reservation systems: A technology-organization-environment framework. *Tourism Management, 53*, 163-172.

Want, R. (2009). When cell phones become computers. *IEEE Pervasive Computing, 8*(2), 2-5.

Weber, K., & Roehl, W. S. (1999). Profiling people searching for and purchasing travel products on the world wide Web. *Journal of Travel Research, 37*(3), 291-298.

WeChat Pay. (2016). *WeChat Pay*. Retrieved December 12, 2017, from https://pay.weixin.qq.com/wechatpay_guide/intro_method.shtml.

Wenjuan website. (2016). *Wenjuan website*. Retrieved July 21, 2016, from https://www.wenjuan.com/survey.

Wester, J. (2016a). *Business strategy: worldwide consumer mobile payments forecast, 2015-2020*. Retrieved July 20, 2016, from https://www.idc.com/getdoc.jsp?containerId=FI256909.

Wester, J. (2016b). *IDC financial insights report*. Retrieved December 12, 2017, from https://www.idc.com/getdoc.jsp?containerId=FI256909.

Wilson, E., & Hollinshead, K. (2015). Qualitative tourism research: opportunities in the emergent soft sciences. *Annals of Tourism Research, 54*, 30-47.

Wirecard. (2016). *Contactless payment*. Retrieved December 12, 2017, from https://www.wirecard.com/products/mobile-payment/payment-with-mobile/.

Wong, I. A. (2011). Using destination attributes to promote event travel: the case of Macau. *Journal of Convention & Event Tourism, 12*(4), 241-252.

Wright, P. (1975). Consumer choice strategies: simplifying vs. optimizing. *Journal of Marketing Research, 12*(1), 60-67.

Xiang, Z., Wang, D., O'Leary, J. T., & Fesenmaier, D. R. (2014). Adapting to the Internet: trends in travelers' use of the Web for trip planning. *Journal of Travel Research, 54*(4), 511-527.

Yang, C. C., Chu, K. H., & Yang, Y. W. (2006). 3G and WLAN interworking security: current status and key issues. *International Journal of Network Security, 2*(1), 1-13.

Yang, Q., Pang, C., Liu, L., Yen, D. C., & Tarn, J. M. (2015). Exploring consumer perceived risk and trust for online payments: An empirical study in China's younger generation. *Computers in Human Behavior, 50*, 9-24.

Yang, S., Lu, Y., Chau, P. Y., & Gupta, S. (2017). Role of channel integration on the service quality, satisfaction, and repurchase intention in a multi-channel (online-cum-mobile) retail environment. *International Journal of Mobile Communications, 15*(1), 1-25.

Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2012). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior, 28*(1), 129-142.

Ye, Q., Law, R., & Gu, B. (2009). The impact of online user reviews on hotel room sales. *International Journal of Hospitality Management, 28*(1), 180-182.

Ye, Q., Law, R., Gu, B., & Chen, W. (2011). The influence of user-generated content on traveler behavior: an empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior, 27*(2), 634-639.

Ye, Q., Li, H., Wang, Z., & Law, R. (2014). The influence of hotel price on perceived service quality and value in e-tourism an empirical investigation based on online traveler reviews. *Journal of Hospitality & Tourism Research, 38*(1), 23-39.

Yuan, J., Morrison, A. M., Linton, S., Feng, R., & Jeon, S. M. (2004). Marketing small wineries: an exploratory approach to website evaluation. *Tourism Recreation Research, 29*(3), 15-25.

Zeithaml, A. A., Parasuraman, A., & Malhotra, A. (2002). Service – quality delivery through websites: a critical review of extant knowledge. *Journal of the Academy of Marketing Science, 30*(4), 362-375.

Zhao, L., Lu, Y., Zhang, L., & Chau, P. Y. (2012). Assessing the effects of service quality and justice on customer satisfaction and the continuance intention of mobile value-added services: An empirical test of a multidimensional model. *Decision Support Systems, 52*(3), 645-656.

Zhong, L., Leung, D., Law, R., Wu, B., & Shao, J. (2014). An application of the capability maturity model for evaluating attraction websites in mainland China. *International Journal of Tourism Research, 16*(5), 429-440.

Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services. *Decision Support Systems, 54*(2), 1085-1091.

Zhou, T. (2015). An empirical examination of users' switch from online payment to mobile payment. *International Journal of Technology and Human Interaction (IJTHI), 11*(1), 55-66.

Appendices

Appendix I. English questionnaire of the pilot test

School of HTM Hotel & Tourism Management

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

Dear Participant:

I am a PhD student of the School of Hotel and Tourism Management, The Hong Kong Polytechnic University. I am conducting a study related to smartphone hotel reservation through online travel agency (OTA) using mobile payment. I would like to invite you to participate in this questionnaire survey. It will take you about 10 minutes to complete the questionnaire survey. The participation is totally voluntary and you can stop at any time during the process. The information collected will solely be used for research. Please be assured that all your responses will be kept strictly confidential. Should you have any questions regarding this questionnaire, please do not hesitate to contact me. It is much appreciated if you can fill in the following questionnaire!

Name: Yiyang Sun, Sunny; **Email address:** yy.sun@

Please answer the following five questions before proceeding to the questionnaire survey.						
1. Have you ever made hotel reservation(s) through OTA(s) via smartphone and used mobile payment for hotel reservation(s) in the past six months?						
1). Yes				2). No (This is the end of the questionnaire survey, thank you for your participation!)		
2. What is the smartphone operation system that you used for your most recent hotel reservation? (Please choose one)						
1). Android system	2). iOS system	3). Windows OS system	4). Symbian system	5). Others. Please specify: _____		
3. What is the OTA that you used for your most recent hotel reservation? (Please choose one).						
1). Ctrip	2). Qunar	3). Tuniu	4). CY	5). Mafengwo	6). Lvmama	7). Others. Please specify: _____
4. I used mobile website for my most recent hotel reservation.						
1). Yes				2). No		
5. I used mobile application (APP) for my most recent hotel reservation.						
1). Yes				2). No		
Part I. Please indicate your level of agreement of the following statements by circling the answers based on your most recent hotel reservation.						
Section I. Hotel reservation						
A. Hotel information				**7-strongly agree --- 1-strongly disagree**		

1. It provides detailed hotel room types.	7	6	5	4	3	2	1
2. Hotel room pictures are referential.	7	6	5	4	3	2	1
3. Hotel room price is clearly displayed.	7	6	5	4	3	2	1
4. It provides detailed location information.	7	6	5	4	3	2	1
5. It offers detailed hotel contact information.	7	6	5	4	3	2	1
6. Hotel check-in time information is clear.	7	6	5	4	3	2	1
7. Hotel check-out time information is clear.	7	6	5	4	3	2	1
B. Communication information and promotion	**7-strongly agree --- 1-strongly disagree**						
On hotel reservation page, without redirecting,							
1. I can easily see the request form.	7	6	5	4	3	2	1
2. I can easily read the hotel reviews.	7	6	5	4	3	2	1
3. I can easily see the hotel promotion information.	7	6	5	4	3	2	1
4. I can easily see "24-hour customer service".	7	6	5	4	3	2	1
C. Transaction	**7-strongly agree --- 1-strongly disagree**						
1. It is quick to complete the hotel reservation.	7	6	5	4	3	2	1
2. It is easy to complete the hotel reservation.	7	6	5	4	3	2	1
D. Interaction	**7-strongly agree --- 1-strongly disagree**						
1. It is easy to post comments.	7	6	5	4	3	2	1 N.A.
2. It is easy to give rating.	7	6	5	4	3	2	1 N.A.
3. It is easy to log in my membership account.	7	6	5	4	3	2	1 N.A.
4. It is easy to share hotel-related information through social media.	7	6	5	4	3	2	1 N.A.
E. Layout design	**7-strongly agree --- 1-strongly disagree**						
1. The overall speed of switching pages is fast.	7	6	5	4	3	2	1
2. It provides personalized search function (e.g., sort by price).	7	6	5	4	3	2	1
3. The layout of the hotel information is appropriate.	7	6	5	4	3	2	1
4. The interface is user-friendly.	7	6	5	4	3	2	1
5. Navigation is easy to follow.	7	6	5	4	3	2	1
F. Compared with my actual stay, the overall quality of hotel information provided by mobile OTAs is:	**7-strongly agree --- 1-strongly disagree**						
1. Reliable	7	6	5	4	3	2	1
2. Complete	7	6	5	4	3	2	1
3. Up to date	7	6	5	4	3	2	1
Part II. Please indicate your level of agreement of the following statements by circling the answers based on your mobile payment for your most recent hotel reservation.							
Section I: Mobile payment							
A. Mobile payment information	**7-strongly agree --- 1-strongly disagree**						
1. It provides clear mobile payment information.	7	6	5	4	3	2	1
2. Mobile website provides clear instructions (i.e., steps) of mobile payment flow.	7	6	5	4	3	2	1
3. The currency information of my travel destination is needed.	1). Yes 2). No (Please go to question 5)						
4. Foreign currency convertor is easy to use.	7	6	5	4	3	2	1
5. Please indicate the type of mobile payment that	1). Alipay 2). WeChat Pay 3). Apple Pay						

you used for your most recent hotel reservation (Please choose one).	4). Others. Please specify: ____						
B. Mobile payment process	**7-strongly agree --- 1-strongly disagree**						
1. When did you use mobile payment?	1). Make reservation 2). Check-out						
2. Mobile payment works well in my smartphone operation system.	7	6	5	4	3	2	1
3. "Payment successful" notification for my hotel reservation is instant once I have completed the mobile payment.	7	6	5	4	3	2	1
4. Mobile payment for hotel reservation is convenient.	7	6	5	4	3	2	1
5. Mobile payment for hotel reservation is quick.	7	6	5	4	3	2	1
6. Mobile payment for hotel reservation is safe.	7	6	5	4	3	2	1
C. My mobile payment experience is:	**7-strongly agree --- 1-strongly disagree**						
1. Good	7	6	5	4	3	2	1
2. Fun	7	6	5	4	3	2	1
3. Enjoyable	7	6	5	4	3	2	1
4. Pleasant	7	6	5	4	3	2	1
D. Subjective norms	**7-strongly agree --- 1-strongly disagree**						
1. Most people in my social network use mobile payment for hotel reservation.	7	6	5	4	3	2	1
2. Most people in my social network wish me to use mobile payment for hotel reservation.	7	6	5	4	3	2	1
3. Most people in my social network would support me in using mobile payment for hotel reservation.	7	6	5	4	3	2	1
4. If people in my social network use mobile payment for hotel reservation, I will use.	7	6	5	4	3	2	1
E. Perceived behavioral control	**7-strongly agree --- 1-strongly disagree**						
1. I am confident in using mobile payment for hotel reservation.	7	6	5	4	3	2	1
2. Mobile payment for hotel reservation is not beyond my control.	7	6	5	4	3	2	1
Section II. Customer satisfaction	**7-strongly agree --- 1-strongly disagree**						
1. I am satisfied with mobile payment for my most recent hotel reservation.	7	6	5	4	3	2	1
2. My choice of using mobile payment to make hotel reservation is a wise one.	7	6	5	4	3	2	1
Section III. Repurchase intention	**7-strongly agree --- 1-strongly disagree**						
1. I will make hotel reservation(s) using mobile payment through **mobile website(s) of OTA(s)** in the next 12 months.	7	6	5	4	3	2	1
2. I will make hotel reservation(s) using mobile payment through **mobile APP(s) of OTA(s)** in the next 12 months.	7	6	5	4	3	2	1
Part III: Demographic information							

Gender	1). Male		2). Female		
I come from	1). Beijing	2). Shanghai	3). Guangzhou	4). Shenzhen	
Age	1). 18 - 27	2). 28 - 37	3). 38 - 47	4). 48- 57	5). 58 or above
The highest education level I obtain	1). Secondary school or below	2). Undergraduate degree	3). Postgraduate degree		
My monthly household income	1). RMB 15,000 or below	2). RMB 15,001 to 25,000	3). RMB 25,001 to 35,000	4). RMB 35,001 to 45,000	5). RMB 45,001 or above
Thank you very much for your participation!!!					

Appendix II. Chinese questionnaire of the pilot test

School of HTM Hotel & Tourism Management

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

亲爱的参与者:

我是来自香港理工大学酒店及旅游业管理学院的一名博士生，现在正在做一项关于通过手机在线旅行社预订酒店并使用手机支付的研究。我诚邀您参与此次问卷调查。完成此次问卷调查大约需要 10 分钟。参加本次调研纯属自愿，您可以随时终止填写此问卷。您的信息将仅用作学术研究，并且您所有的回答将严格保密。如您对此问卷有任何疑问，请随时与我联系。如您能完成此问卷，我将不胜感激！

联系人：孙意央 (Sunny)；**电子邮箱**：yy.sun@

在正式回答问卷之前，请先回答以下五个问题。						
1. 您是否在过去 6 个月中通过手机在线旅行社预订过酒店并使用了手机支付？						
1）是				2）否 （问卷结束，感谢您的参与！）		
2. 您最近一次预订酒店时使用的手机系统是？ （请仅选择一个）						
1). 安卓系统	2). iOS 系统	3).微软系统	4). 塞班系统	5). 其它. 请说明：____		
3. 最近一次预订酒店时，您使用的手机在线旅行社是？ (请仅选择一个)						
1). 携程	2). 去哪儿	3). 途牛	4). 畅游	5). 蚂蜂窝	6). 驴妈妈	7). 其它. 请说明：____
4. 最近一次酒店预订我使用了手机网页版。						
1). 是				2). 否		
5. 最近一次酒店预订我使用了手机应用程序（APP）。						
1). 是				2). 否		
第一部分. 请基于您最近一次酒店预定，圈出您对于以下陈述的赞同程度。						
一. 酒店预订						
A. 酒店信息	**7-非常赞同 --- 1-非常不赞同**					
1. 提供了具体的酒店房型信息。	7	6	5	4	3	2	1
2. 提供的酒店房间照片具有参考价值。	7	6	5	4	3	2	1
3. 提供了清晰的酒店价格。	7	6	5	4	3	2	1
4. 提供了具体的酒店地址。	7	6	5	4	3	2	1
5. 提供了具体的酒店联系方式。	7	6	5	4	3	2	1
6. 提供了清晰的酒店入住时间信息 。	7	6	5	4	3	2	1
7. 提供了清晰的酒店退房时间信息 。	7	6	5	4	3	2	1
B. 交流信息以及促销	**7-非常赞同 --- 1-非常不赞同**					
在酒店预订页面，无需跳转，						
1. 我很容易看到个性化要求对话框。	7	6	5	4	3	2	1

2. 我很容易看到酒店评论。	7	6	5	4	3	2	1	
3. 我很容易看到酒店促销信息。	7	6	5	4	3	2	1	
4. 我很容易看到“24 小时顾客服务”。	7	6	5	4	3	2	1	
C. 交易过程	**7-非常赞同 --- 1-非常不赞同**							
1. 完成酒店预订很迅速。	7	6	5	4	3	2	1	
2. 完成酒店预订很容易。	7	6	5	4	3	2	1	
D. 互动功能	**7-非常赞同 --- 1-非常不赞同**							
1. 写评论很容易。	7	6	5	4	3	2	1	不适用
2. 打分很容易。	7	6	5	4	3	2	1	不适用
3. 会员登录很容易。	7	6	5	4	3	2	1	不适用
4. 把酒店相关信息分享到社交网络很容易。	7	6	5	4	3	2	1	不适用
E. 版面设计	**7-非常赞同 --- 1-非常不赞同**							
1.页面切换速度很快。	7	6	5	4	3	2	1	
2. 提供了个性化服务 (例如按价格搜索)。	7	6	5	4	3	2	1	
3. 版面布局很合理。	7	6	5	4	3	2	1	
4. 操作界面很好用。	7	6	5	4	3	2	1	
5. 操作指引很清晰。	7	6	5	4	3	2	1	
F. 和我实际入住相比较，手机在线旅行社的总体酒店信息质量是：	**7-非常赞同 --- 1-非常不赞同**							
1. 可信的	7	6	5	4	3	2	1	
2. 完整的	7	6	5	4	3	2	1	
3. 最新的	7	6	5	4	3	2	1	

第二部分. 请基于您最近一次预订酒店时所使用的手机支付，圈出您对于以下陈述的赞同程度。

一．手机支付

A. 手机支付信息	**7-非常赞同 --- 1-非常不赞同**
1. 提供了清晰的手机支付方式信息。	7 6 5 4 3 2 1
2. 手机网页版提供了清晰的手机支付流程（步骤）信息。	7 6 5 4 3 2 1
3. 我需要旅游目的地货币兑换信息。	1). 是 2). 否（请跳转至第 5 题）
4. 外币汇率计算器很好用。	7 6 5 4 3 2 1
5. 请选择一种您最近一次预订酒店使用的手机支付方式 (请仅选择一种)。	1). 支付宝 2). 微信支付 3). 苹果支付 4). 其它. 请说明:_____
B. 手机支付过程	**7-非常赞同 --- 1-非常不赞同**
1. 您于何时使用手机支付？	1). 预定时 2). 退房时
2. 手机支付与我的手机系统兼容性很高。	7 6 5 4 3 2 1
3. 当我用手机支付完成酒店预订后，我能立刻收到手机支付成功的信息。	7 6 5 4 3 2 1
4. 使用手机支付预订酒店很方便。	7 6 5 4 3 2 1
5. 使用手机支付预订酒店很快捷。	7 6 5 4 3 2 1

6. 使用手机预订预订酒店很安全。	7	6	5	4	3	2	1
C. 手机支付体验：	**7-非常赞同 --- 1-非常不赞同**						
1. 很好。	7	6	5	4	3	2	1
2. 充满乐趣。	7	6	5	4	3	2	1
3. 很享受。	7	6	5	4	3	2	1
4. 令人愉悦。	7	6	5	4	3	2	1
D. 主观规范	**7-非常赞同 --- 1-非常不赞同**						
1. 我的大部分朋友都使用手机支付预订酒店。	7	6	5	4	3	2	1
2. 我的大部分朋友希望我用手机支付预订酒店。	7	6	5	4	3	2	1
3. 我的大部分朋友支持我用手机支付预订酒店。	7	6	5	4	3	2	1
4. 如果我社交网络中的大部分朋友用手机支付预订酒店，我也会用。	7	6	5	4	3	2	1
E. 行为控制	**7-非常赞同 --- 1-非常不赞同**						
1. 我对于使用手机支付预订酒店很有把握。	7	6	5	4	3	2	1
2. 对于手机支付预订酒店，我能应用自如。	7	6	5	4	3	2	1
二. 顾客满意度	**7-非常赞同 --- 1-非常不赞同**						
1. 我对于最近一次预订酒店手机支付体验很满意。	7	6	5	4	3	2	1
2. 我用手机支付来预定酒店是一个明智的选择。	7	6	5	4	3	2	1
三 . 回购意愿	**7-非常赞同 --- 1-非常不赞同**						
1. 在未来 12 个月，我将再次使用**手机网页版在线旅游**预订酒店并使用手机支付。	7	6	5	4	3	2	1
2. 在未来 12 个月，我将再次使用**手机 APP 版在线旅游**预订酒店并使用手机支付。	7	6	5	4	3	2	1

第三部分: 个人信息					
性别	1). 男		2). 女		
我来自	1).北京	2).上海	3). 深圳	4). 广州	
年龄	1). 18 – 27 岁	2). 28 – 37 岁	3). 38 – 47 岁	4). 48- 57 岁	5). 58 岁或以上
我所受过的最高教育程度	1). 高中或以下	2). 本科学历	3). 研究生学历或以上		
家庭月收入	1). 人民币 15,000 或以下	2). 人民币 15,001 - 25,000	3). 人民币 25,001 - 35,000	4). 人民币 35,001 - 45,000	5). 人民币 45,001 或以上
非常感谢您的参与!!!					

Appendix III. English questionnaire of the study

School of Hotel & Tourism Management

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

Dear Participant:

I am a PhD student of the School of Hotel and Tourism Management, The Hong Kong Polytechnic University. I am conducting a study related to mobile hotel reservation through online travel agency (OTA) using mobile payment. I would like to invite you to participate in this questionnaire survey. It will take you about 10 minutes to complete the questionnaire survey. The participation is totally voluntary and you can stop at any time during the process. The information collected will solely be used for research. Please be assured that all your responses will be kept strictly confidential. Should you have any questions regarding this questionnaire, please do not hesitate to contact me. It is much appreciated if you can fill in the following questionnaire!

Name: Yiyang Sun, Sunny; **Email address:** yy.sun@

Please answer the following five questions before proceeding to the questionnaire survey.								
a. Have you ever made hotel reservation(s) through OTA(s) via smartphone and used mobile payment for hotel reservation(s) in the past six months?								
1). Yes				2). No (This is the end of the questionnaire survey, thank you for your participation!)				
b. What is the smartphone brand that you used for your most recent hotel reservation via mobile Internet? Please specify: _____								
c. What is the smartphone operation system that you used for your most recent hotel reservation? (Please choose one)								
1). Android system	2). iOS system	3). Windows OS system	4). Symbian system	5). Others. Please specify: _____				
d. What is the OTA that you used for your most recent hotel reservation? (Please choose one)								
1). Ctrip	2). Qunar	3). eLong	4). Tuniu	5). CY	6). Mafengwo	7). Lvmama	8). Alitrip	9). Others. Please specify: ___
e. Which platform did you use for your most recent hotel reservation? _____								
1). Mobile website				2). Mobile application (APP)				

Part I. Please indicate your level of agreement of the following statements by circling the answers based on your most recent hotel reservation.							
Section I. Hotel reservation							
A. Hotel information	**7-strongly agree --- 1-strongly disagree**						
1. It provides detailed hotel room types.	7	6	5	4	3	2	1
2. Hotel room pictures are referential.	7	6	5	4	3	2	1
3. Hotel room price is clearly displayed.	7	6	5	4	3	2	1
4. It provides detailed hotel location information.	7	6	5	4	3	2	1
5. It offers detailed hotel contact information.	7	6	5	4	3	2	1
6. Hotel earliest check-in time information is clear.	7	6	5	4	3	2	1

7. Hotel latest check-out time information is clear.	7	6	5	4	3	2	1	
8. It provides detailed information about hotel change policy.	7	6	5	4	3	2	1	
9. It provides detailed information about hotel cancellation policy.	7	6	5	4	3	2	1	
B. Communication information and promotion	**7-strongly agree --- 1-strongly disagree**							
On the page of hotel reservation, without scrolling down,								
1. I can easily see "24-hour customer service".	7	6	5	4	3	2	1	
2. I can easily see the request form.	7	6	5	4	3	2	1	
3. I can easily read the hotel reviews.	7	6	5	4	3	2	1	
4. I can easily see the hotel promotion information.	7	6	5	4	3	2	1	
C. Transaction	**7-strongly agree --- 1-strongly disagree**							
1. It is quick to complete the hotel reservation.	7	6	5	4	3	2	1	
2. It is easy to complete the hotel reservation.	7	6	5	4	3	2	1	
D. Interaction	**7-strongly agree --- 1-strongly disagree**							
1. It is easy to post comments.	7	6	5	4	3	2	1	N.A.
2. It is easy to give rating.	7	6	5	4	3	2	1	N.A.
3. It is easy to log in my membership account.	7	6	5	4	3	2	1	N.A.
4. It is easy to share hotel-related information through social media.	7	6	5	4	3	2	1	N.A.
E. Layout design	**7-strongly agree --- 1-strongly disagree**							
1. The overall speed of switching pages is fast.	7	6	5	4	3	2	1	
2. It provides a personalized search function (e.g., sort by price).	7	6	5	4	3	2	1	
3. The layout of the hotel information is appropriate.	7	6	5	4	3	2	1	
4. The interface is user-friendly.	7	6	5	4	3	2	1	
5. Navigation is easy to follow.	7	6	5	4	3	2	1	
F. Compared with your actual stay, the overall quality of hotel information provided by mobile OTA is:	**7-strongly agree --- 1-strongly disagree**							
1. Reliable	7	6	5	4	3	2	1	
2. Complete	7	6	5	4	3	2	1	
3. Up to date	7	6	5	4	3	2	1	
Section II. Customer satisfaction	**7-strongly agree --- 1-strongly disagree**							
1. I am satisfied with the hotel information provided by mobile OTA.	7	6	5	4	3	2	1	
Please feel free to provide reasons/comments to any of your evaluations.								

Part II. Please indicate your level of agreement of the following statements by circling the answer based on your mobile payment regarding your most recent reservation.	
Section I: Mobile payment	
A. Mobile payment information	**7-strongly agree --- 1-strongly disagree**
1. It provides clear mobile payment method information.	7 6 5 4 3 2 1
2. Mobile website provides clear instructions (i.e., steps) of mobile payment flow.	7 6 5 4 3 2 1 | N.A.
3. The currency information of my travel destination is needed.	1). Yes 2). No (Please go to question 5)
4. Foreign currency convertor is easy to use.	7 6 5 4 3 2 1
5. Please select the mobile payment method that you used for your most recent hotel reservation (Please choose one).	1). Alipay 2). WeChat Pay 3). Apple Pay 4). Others. Please specify: ____
B. My mobile payment process is:	**7-strongly agree --- 1-strongly disagree**
1. When did you use mobile payment?	1). When I make reservation 2). When I check-in 3). When I check-out
2. Mobile payment works well in my smartphone operation system.	7 6 5 4 3 2 1
3. "Payment successful" notification for my hotel reservation is instant once I have completed mobile payment.	7 6 5 4 3 2 1
4. Mobile payment for my hotel reservation is convenient.	7 6 5 4 3 2 1
5. Mobile payment for my hotel reservation is quick.	7 6 5 4 3 2 1
6. Mobile payment for my hotel reservation is safe.	7 6 5 4 3 2 1
C. Mobile payment experience is:	**7-strongly agree --- 1-strongly disagree**
1. Good	7 6 5 4 3 2 1
2. Fun	7 6 5 4 3 2 1
3. Enjoyable	7 6 5 4 3 2 1
4. Pleasant	7 6 5 4 3 2 1
D. Social norms	**7-strongly agree --- 1-strongly disagree**
1. Most people in my social network use mobile payment for hotel reservation.	7 6 5 4 3 2 1
2. Most people in my social network wish me to use mobile payment for hotel reservation.	7 6 5 4 3 2 1
3. Most people in my social network would support me in using mobile payment for hotel reservation.	7 6 5 4 3 2 1
4. If people in my social network use mobile payment for hotel reservation, I will use.	7 6 5 4 3 2 1
E. Perceived behavioral control	**7-strongly agree---1-strongly disagree**
1. I am confident in using mobile payment for hotel reservation.	7 6 5 4 3 2 1
2. Mobile payment for hotel reservation is not beyond my control.	7 6 5 4 3 2 1

Section II. Customer satisfaction	**7-strongly agree --- 1-strongly disagree**						
1. I am satisfied with mobile payment experience for my most recent hotel reservation.	7	6	5	4	3	2	1
2. My choice of using mobile payment to make hotel reservation is a wise one.	7	6	5	4	3	2	1
Section III. Repurchase intention	**7-strongly agree --- 1-strongly disagree**						
1. I will make hotel reservation(s) using mobile payment through **mobile website(s) of OTA(s)** in the next 12 months.	7	6	5	4	3	2	1
2. I will make hotel reservation(s) using mobile payment through mobile **APP(s) of OTA(s)** in the next 12 months.	7	6	5	4	3	2	1
Please feel free to provide reasons/comments of your evaluations.							

Part III: Demographic information					
Gender	1). Male		2). Female		
I come from	1). Beijing	2). Shanghai	3). Guangzhou	4). Shenzhen	
Age	1). 18 - 27	2). 28 - 37	3). 38 - 47	4). 48 - 57	5). 58 or above
The highest education level I obtain	1). Secondary school or below	2) College degree	3). Undergraduate degree	4). Postgraduate degree	
My monthly household income	1). RMB 15,000 or below	2). RMB 15,001 to 25,000	3). RMB 25,001 to 35,000	4). RMB 35,001 to 45,000	5). RMB 45,001 or above
Thank you very much for your participation!!!					

Appendix IV. Chinese questionnaire of the study

School of Hotel & Tourism Management HTM

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

亲爱的参与者:

我是来自香港理工大学酒店及旅游业管理学院的一名博士生，现在正在做一项关于通过手机在线旅行社预订酒店并使用手机支付的研究。我诚邀您参加此次问卷调查。完成此次问卷调查大约需要 10 分钟。参加本次调研纯属自愿，您可以随时终止填写此问卷。您的信息将仅用作学术研究，并且您所有的回答将严格保密。如您对此问卷有任何疑问，请随时与我联系。如您能完成此问卷，我将不胜感激！

联系人：孙意央 (Sunny) **电子邮箱**: yy.sun@

在正式回答问卷之前，请先回答以下五个问题。								
a. 您是否在过去 6 个月中通过手机在线旅行社预订过酒店并使用了手机支付？								
1）是				2）否 （问卷结束，感谢您的参与！）				
b. 您最近一次通过手机预订酒店时使用的手机品牌是？ 请说明：_____								
c. 您最近一次通过手机预订酒店时使用的手机系统是？ (请仅选择一个)								
1). 安卓系统	2). iOS 系统	3). 微软系统	4). 塞班系统	5). 其它. 请说明：_____				
d. 您最近一次酒店预订使用的在线旅行社是？ (请选择一个)								
1). 携程	2). 去哪儿	3). 艺龙	4). 途牛	5). 畅游	6). 蚂蜂窝	7). 驴妈妈	8). 阿里旅行	9). 其它. 请说明：__
e. 最近一次预订酒店時您使用了_____。								
1). 手机网页版				2). 手机应用程序 (APP)				

第一部分. 请基于您最近一次酒店预定，圈出您对于以下陈述的赞同程度。							
一. 酒店预订							
A. 酒店信息	**7-非常赞同 --- 1-非常不赞同**						
1. 提供了具体的酒店房型信息。	7	6	5	4	3	2	1
2. 提供的酒店房间照片具有参考价值。	7	6	5	4	3	2	1
3. 提供了清晰的酒店价格。	7	6	5	4	3	2	1
4. 提供了具体的酒店地址。	7	6	5	4	3	2	1
5. 提供了具体的酒店联系方式。	7	6	5	4	3	2	1
6. 提供了清晰的酒店最早入住时间信息。	7	6	5	4	3	2	1
7. 提供了清晰的酒店最迟退房时间信息。	7	6	5	4	3	2	1
8. 提供了具体的酒店更改政策信息。	7	6	5	4	3	2	1

9. 提供了具体的酒店取消政策信息。	7 6 5 4 3 2 1
B. 交流信息以及促销	**7-非常赞同 --- 1-非常不赞同**
在酒店预订页面， 无需下拉,	
1. 我很容易看到“24 小时顾客服务”。	7 6 5 4 3 2 1
2. 我很容易看到个性化要求对话框。	7 6 5 4 3 2 1
3. 我很容易看到酒店评论。	7 6 5 4 3 2 1
4. 我很容易看到酒店促销信息。	7 6 5 4 3 2 1
C. 交易过程	**7-非常赞同 --- 1-非常不赞同**
1. 完成酒店预订很迅速。	7 6 5 4 3 2 1
2. 完成酒店预订很容易。	7 6 5 4 3 2 1
D. 互动功能	**7-非常赞同 --- 1-非常不赞同**
1. 写评论很方便。	7 6 5 4 3 2 1 不适用
2. 打分很容易。	7 6 5 4 3 2 1 不适用
3. 会员登录很方便。	7 6 5 4 3 2 1 不适用
4. 把酒店相关信息分享到社交网络很容易。	7 6 5 4 3 2 1 不适用
E. 版面设计	**7-非常赞同 --- 1-非常不赞同**
1. 页面切换速度很快。	7 6 5 4 3 2 1
2. 提供了个性化搜索功能 (例如按价格搜索)。	7 6 5 4 3 2 1
3. 版面布局很合理。	7 6 5 4 3 2 1
4. 操作界面很好用。	7 6 5 4 3 2 1
5. 操作指引很清晰。	7 6 5 4 3 2 1
F. 和我实际入住相比较，手机在线旅行社提供的总体酒店信息质量是：	**7-非常赞同 --- 1-非常不赞同**
1. 可信的	7 6 5 4 3 2 1
2. 完整的	7 6 5 4 3 2 1
3. 最新的	7 6 5 4 3 2 1
二. 顾客满意度	**7-非常赞同 --- 1-非常不赞同**
1. 手机在线旅行社提供的酒店信息我很满意。	7 6 5 4 3 2 1
如您愿意，请分享给出以上问题评分的原因/意见。	

第二部分. 请基于您最近一次预订酒店时所使用的手机支付，圈出您对于以下陈述的赞同程度。	
一．手机支付	
A．手机支付信息	**7-非常赞同 --- 1-非常不赞同**
1. 提供了手机支付方式信息。	7 6 5 4 3 2 1
2. 手机网页版提供了清晰的手机支付流程（步骤）信息。	7 6 5 4 3 2 1 | 不 适 用
3. 我需要旅游目的地货币兑换信息。	1).是 2).否（请跳转至第 5 题）
4. 外币汇率计算器很好用。	7 6 5 4 3 2 1
5. 请选择一种您最近一次预订酒店使用的手机	1). 支付宝 2). 微信支付

支付方式 (请仅选择一种)。	3). 苹果支付 4). 其它.请说明__
B. 手机支付过程	**7-非常赞同 --- 1-非常不赞同**
1. 您于何时使用手机支付？	1). 预定时 2). 入住时 3). 退房时
2. 手机支付和我的手机系统兼容性很高。	7 6 5 4 3 2 1
3. 当我用手机支付完成酒店预订后，我能立刻收到手机支付成功信息。	7 6 5 4 3 2 1
4. 预订酒店时，使用手机支付很方便。	7 6 5 4 3 2 1
5. 预订酒店时，使用手机支付很快捷。	7 6 5 4 3 2 1
6. 预订酒店时，使用手机很安全。	7 6 5 4 3 2 1
C. 手机支付体验：	**7-非常赞同 --- 1-非常不赞同**
1. 很好。	7 6 5 4 3 2 1
2. 充满乐趣。	7 6 5 4 3 2 1
3. 很享受。	7 6 5 4 3 2 1
4. 令人愉悦。	7 6 5 4 3 2 1
D. 社会规范	**7-非常赞同 --- 1-非常不赞同**
1. 我的大部分朋友都使用手机支付预订酒店。	7 6 5 4 3 2 1
2. 我的大部分朋友希望我用手机支付预订酒店。	7 6 5 4 3 2 1
3. 我的大部分朋友支持我用手机支付预订酒店。	7 6 5 4 3 2 1
4. 如果我的大部分朋友用手机支付预订酒店，我也会用。	7 6 5 4 3 2 1
E. 行为控制	**7-非常赞同 --- 1-非常不赞同**
1. 我对于使用手机支付预订酒店很有把握。	7 6 5 4 3 2 1
2. 对于手机支付预订酒店，我能应用自如。	7 6 5 4 3 2 1
二. 顾客满意度	**7-非常赞同 --- 1-非常不赞同**
1. 我对于最近一次酒店预订手机支付体验很满意。	7 6 5 4 3 2 1
2. 我用手机支付来预定酒店是一个明智的选择。	7 6 5 4 3 2 1
三 . 回购意愿	**7-非常赞同 --- 1-非常不赞同**
1. 在未来 12 个月，我将再次使用**手机网页版在线旅游**订酒店并使用手机支付。	7 6 5 4 3 2 1
2. 在未来 12 个月， 我将再次使用**手机 APP 版在线旅游**预订酒店并使用手机支付。	7 6 5 4 3 2 1
如您愿意，请分享给出以上问题评分的原因/意见。	

第二部分: 个人信息					
性别	1). 男			2). 女	
我来自	1).北京	2).上海		3). 深圳	4). 广州
年龄	1). 18 – 27 岁	2). 28 – 37 岁	3). 38 – 47 岁	4). 48 - 57 岁	5). 58 岁或以上
我所受过的最高教育程度	1). 高中或以下	2). 大专	2). 本科学历	3). 研究生学历或以上	
我的家庭月收入	1). 人民币 15,000 或以下	2). 人民币 15,001 - 25,000	3). 人民币 25,001 - 35,000	4). 人民币 35,001 - 45,000	5). 人民币 45,001 或以上
非常感谢您的参与！！！					