Analysing behavioural differences between e- and m-bookers in hotel booking

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Abstract

This study analysed the behavioural differences between e- and m-bookers in online hotel booking. The theoretical relationships among functionality and usability, perceived value for money and time, and satisfaction and loyalty were analysed based on the quality–satisfaction–loyalty framework. Results from a sample of 431 and 401 e- and m-bookers, respectively, affirmed the similarities and differences between the two types of bookers. Results also showed that e- and m-bookers substantially differ in their perceptions on functionality and usability performance, perceived value for money and relative importance of functionality and usability in online hotel booking. Moreover, the findings revealed the moderating effects of perceived value for money and time on the satisfaction–loyalty link among m-bookers.

Keywords: online hotel booking; e-booker; m-booker; computer website; mobile app; quality–satisfaction–loyalty

1. Introduction

Consumers are now purchasing tourism products/services online more than ever. An increasing number of travellers search travel information and book reservations through various online channels, such as computer websites and mobile applications (apps). Mobile technologies provide consumers alternatives and offer tourism and hospitality practitioners additional distribution channels (Wang et al., 2016). PhoCusWright reported that the total mobile travel booking in the US reached $75.85 billion in 2017, while the number of computer travel booking (from desktop or laptop) decreased by 1.6% (eMarketer, 2017). With the rapid development of mobile tourism, an increasing number of hospitality operators have supplemented their desktop Internet channels with mobile Internet channels. However, information is limited regarding the factors that affect the satisfaction and loyalty of m-bookers towards hotel booking. What should

be included in mobile channels remains unclear to industry practitioners (Shankar et al., 2016). The behaviours of e- and m-bookers may also differ from each other because of the features and advantages of mobile technologies, such as localisation, personalisation and easy accessibility (Singh and Swait, 2017). Thus, identifying and analysing the behavioural differences and similarities between e- and m-bookers are essential for the effective management of online distribution channels in multi-channel environments.

Consumers prefer apps to websites when purchasing products/services via mobile devices (Tan et al., 2017; Xu et al., 2014). A survey on m-tourism indicated that consumers have a definite preference for mobile apps. Approximately 37% of business travellers prefer apps, whereas only 10% favour mobile websites (Tourism-review, 2014). The current study focused on apps rather than websites as mobile channels for hotel booking. M-bookers refer to travellers who book hotels via mobile apps. By contrast, e-bookers refer to travellers who book hotels via websites, which are accessible via desktop and laptop computers.

Although e-tourism literature features numerous achievements, studies on m-tourism remain insufficient (Liang et al., 2017; Tan et al., 2017). Given the different preferences and behaviours of e- and m-bookers (Kim et al., 2015; Singh and Swait, 2017), a close examination of the behavioural differences in purchasing via desktop and mobile channels is warranted (Singh and Swait, 2017). However, the differences and similarities between the two types of bookers remain poorly understood in the tourism and hospitality fields. Moreover, while extant studies on mobile apps have focused on the factors that influence app demand or adoption (Okumus et al., 2018; Tan et al., 2017), the ways to enhance app quality for improved purchasing experience and satisfaction, and thus building customer loyalty, remain under-researched (Shankar et al., 2016).

Usability and functionality performance were identified as important dimensions of website quality (Bai et al., 2008; Wang et al., 2015). Previous studies on mobile app quality pointed out the considerable effect of usability on m-bookers' decisions (Bhandari et al., 2017; Shankar et al., 2016). However, the factors that constitute mobile app quality in the context of m-tourism remain poorly understood. The value of time on mobile purchasing was likewise highlighted in recent studies (e.g. Kim et al., 2015; Singh and Swait, 2017), but the focus on perceived value for time was much less than what was given to perceived value for money. Extant research either merely investigated monetary value (Ponte et al., 2015) or considered value for money and time as one variable (Wu et al., 2014). In this context, psychology literature argues that time and money are two distinct concepts (Mogilner, 2010). Thus, measuring these concepts as one or measuring one over the other is erroneous.

The quality–satisfaction–loyalty framework suggests that high perceived quality leads to high satisfaction and loyalty (Lin and Wang, 2015). Although this framework has been extensively applied in the literature (Kim et al., 2013; Lin et al., 2014), the interrelationships among its constructs have yet to be agreed upon. Moreover, the mediator and moderator of such a framework remain unidentified. Particularly, the role of perceived value is ambiguous. A few researchers affirmed that perceived value mediates the perceived quality–satisfaction link (Lin and Wang, 2015). However, other scholars confirmed that perceived quality and value are the antecedents of

satisfaction (Kim et al., 2013). These studies were mainly based on the pre- and on-purchase stages. Unfortunately, the role of perceived value at the post-purchase stage—particularly in the transformation of satisfaction and loyalty—is not substantially supported.

The current study primarily aims to analyse the behavioural differences between e- and m-bookers regarding hotel reservation. In particular, this study targets three objectives based on the quality–satisfaction–loyalty framework:

(1) To compare the differences and similarities between e- and m-bookers in hotel booking.

(2) To investigate the factors that affect customers' choice of using computer websites or mobile apps for hotel booking.

(3) To analyse the moderating effect of perceived value variables on satisfaction–loyalty relationships.

2. Literature Review

2.1. Online hotel booking

Hospitality practitioners must understand the online booking behaviours of customers, whereas scholars must exert immense effort on identifying the factors that affect online booking decisions (Bai et al., 2008; Casaló et al. 2015; Li et al., 2017; Wang et al., 2015). Previous studies identified perceived quality (functionality and usability), online hotel rating and complementarity as antecedents (Casaló et al. 2015; Li et al., 2017), whereas satisfaction and e-trust were identified as mediators (Bai et al., 2008; Wang et al., 2015) and booking intentions as the outcome (Wang et al., 2015).

The perceived quality of the website has a significant influence on online hotel booking decisions (Leung et al., 2016; Wang et al., 2015). In e-commerce literature, perceived quality is defined as the e-service quality of websites; it is related to the assessment of consumers on whether a website's performance satisfies their needs (Hahn et al., 2017). Perceived quality comprises several dimensions, including responsiveness, security, customer relationships, usability and functionality (Hahn et al., 2017; Lin and Wang, 2015). Among these dimensions, usability and functionality are of top importance (Bai et al., 2008; Leung et al., 2016; Wu et al., 2018). The current study analysed the effect of perceived quality on the satisfaction level of e- and m-bookers on the basis of a comprehensive review of related literature. Perceived quality is defined as the usability and functionality performance of computer websites or mobile apps, while price and perceived value are commonly used interchangeably (Ali et al., 2013). Thus, to avoid potential confusion, the current study regards price and 'perceived value' (in relation to perceived price) as perceived value for money.

2.2. Theoretical foundations and hypothesis development

2.2.1 Quality–satisfaction–loyalty framework

The quality–satisfaction–loyalty framework is based on the appraisal process–emotional reaction–coping response framework of Bagozzi (1992). Originally used to explain how attitude results in intention, Bagozzi's (1992) framework defines appraisal as the assessment on the effects of internal or external conditions on one's well-being. An individual who experiences an outcome–desire fulfilment emits emotional reactions, such as satisfaction and pleasure. Under such conditions, specific intentions are likely to emerge, remain or increase the joy (Kim et al., 2013). By contrast, the appraisal of an unpleasant experience leads to emotional reactions, such as dissatisfaction and anger (Lin et al., 2014). Specific intentions may cope with an outcome–desire conflict. Accordingly, a specific coping response will occur, thereby reducing the risk of such an unpleasant experience. For instance, if a traveller finds that hotel reservation via a mobile app is complicated, he/she may not use the app again. Negative word-of-mouth about the mobile app may also emerge.

The quality–satisfaction–loyalty link is adopted from the appraisal of the process–emotional reaction–coping response framework. To investigate the relationships among perceived quality, satisfaction and loyalty, this framework has been empirically validated across different contexts (Kim et al., 2013). The quality–satisfaction–loyalty link suggests that service quality with high cognitive orientation can result in substantial emotive satisfaction, thereby driving potential loyalty (Lin et al., 2014). Extensive studies have investigated the links between 'perceived quality and value' and 'satisfaction and loyalty' (Lin and Wang, 2015; Wu and Li, 2017). However, a consensus on the interrelationships among these constructs has yet to be reached. Several researchers verified that perceived quality and value are positively associated with customer satisfaction (Kim et al., 2013). However, other scholars asserted that perceived quality variables indirectly influence customer satisfaction through perceived value (Lin and Wang, 2015). Satisfaction has been extensively demonstrated as an important mediator between perceived quality and customer loyalty (Lin et al., 2014). In the e-tourism context, website quality (e.g. functionality and usability) directly affects the satisfaction of online customers, thereby leading to online booking intentions (Bai et al., 2008; Wang et al., 2015).

2.2.2 Perceived quality

In e-tourism literature, functionality and usability performances have been identified as the major variables for analysing the perceived quality of a website (Bai et al., 2008; Wang et al., 2015). Functionality performance refers to the content quality of a website, especially information about the products and services offered (Bai et al., 2008; Leung et al., 2016). By contrast, usability performance relates to a website's design quality which can be assessed by various aspects, such as degree of ease and enjoyableness (Wang et al., 2015). High perceived quality is related to high consumer satisfaction (Chang et al., 2009; Lin et al., 2014). In hospitality research, functionality has been empirically investigated as one of the variables of a website's perceived quality to determine consumer satisfaction (Bai et al., 2008; Leung et al., 2016). Despite limited empirical evidence on the importance of app functionality in m-tourism, emerging research has verified that informational value is one of the dimensions that mobile users substantially value (Shankar et al.,

2016; Wu et al., 2018). A recent research on hotel-related mobile apps revealed that functionality and usability performances are indispensable features that are constantly evaluated by users (Wu et al., 2018). Therefore, functionality performance is expected to considerably affect the satisfaction level of e- and m-bookers.

Empirical evidence shows that the effect of factors on user attitude is remarkably different between mobile and non-mobile users (Wang et al., 2016; Singh and Swait, 2017). A study on m-tourism indicated the considerable difference between computer and smartphone platforms in terms of user queries (Wang et al., 2016), suggesting the varying requirements of users for information. Users are substantially concerned with the depth and completeness of information when using traditional websites. However, they only look for essential information when using mobile apps, which can deliver contextually relevant information, such as location and weather. Unlike computer websites, mobile apps also continue to gather data from customers even when the latter are inactive (Shankar et al., 2016). Recent m-tourism research also confirmed that timely and accurate product information is particularly important for mobile hotel reservation (Tan et al., 2017). Therefore, the perceived functionality performance of mobile apps in the context of online hotel booking is likely different from that of computer websites. Hypotheses 1a and 1b are proposed based on the preceding analysis.

H1a: Functionality performance positively affects consumer satisfaction.

H1b: Perception of functionality performance differs between booking through a computer website and a mobile app.

Usability, which refers to design, is another critical factor that constitutes a website's performance (Bai et al., 2008; Hahn et al., 2017). A poorly designed website is generally unattractive to customers and can thus result in customer loss (Wang et al., 2015). In tourism and hospitality literature, researchers have investigated the positive and significant influence of usability on consumer satisfaction towards computer websites (Bai et al., 2008). Factors that affect the usability performance of mobile websites have been analysed in tourism research (Stienmetz et al., 2013). Results confirmed that structure and ease of use should be considered in improving the usability of mobile websites. However, the usability performance of mobile apps remains poorly analysed.

The user interface and screen navigation of smartphones are relatively different from those of a traditional computer (Singh and Swait, 2017). A mobile app features a small screen and a different navigation design compared with a computer website. Despite the limited screen, a mobile device can provide location-based services and assist in tracking the behaviours and habits of tourists (Crew, 2016). Travellers do not have to remember their activities because a mobile app can maintain a record of what they need wherever they are. Mobile technologies satisfy the current need of tourism and hospitality customers (Shankar et al., 2016; Wang et al., 2016). In terms of hotel reservation, the perceived usability performance of a mobile app differs from that of a computer website. Therefore, we posit the following hypotheses based on the preceding analysis:

H2a: Usability performance positively affects consumer satisfaction.

H2b: Perception of usability performance differs between booking through a computer website and a mobile app.

2.2.3 Satisfaction and loyalty

According to the quality–satisfaction–loyalty framework, satisfaction is an emotional reaction; perceived quality refers to the assessment of services/products and loyalty is the coping response to satisfaction (Bagozzi, 1992). Current m-tourism research provides empirical evidence on the factors that affect customer satisfaction for tourism purchasing (Kim et al., 2015). However, loyalty has rarely been incorporated as an important consequence to existing m-Tourism models. Loyalty refers to one's attachment or deep commitment to certain products/services (Pritchard et al., 1999), whereas satisfaction is the extent to which customers believe their purchase experience meets their requirements (Bai et al., 2008). Experiential quality positively affects tourist satisfaction; hence, satisfaction positively affects tourist loyalty (Wu and Li, 2017). The current study aims to analyse the relationship between satisfaction and loyalty via hotel booking on computer websites and mobile apps. Therefore, we posit the following hypothesis:

H3: Consumer satisfaction positively affects consumer loyalty.

2.2.4 Perceived value

Existing studies on tourism generally delved on perceived value as a functional value that merely considers the value for money (Sanchez et al., 2006; Ponte et al., 2015). Compared with the investigation on perceived value for money, limited effort has been exerted towards perceived value for time. Psychology literature indicates that money and time are two of the most valuable and beneficial resources for an individual to possess happiness (DeVoe and House, 2012). Money is closely related to utility, while time is considerably related to one's emotional fulfilment (Mogilner, 2010). Moreover, value for time should be considered and tested empirically because time-saving is important in the context of mobile tourism (Kim et al., 2015). Perceived value is also a dynamic construct that can be realised before, during and after purchase, and the perceptions at each stage are likely to differ from one person to another (Sanchez et al., 2006). The perceived value in the current study refers to the perceived value for money or time at the post-purchase stage. As such, the valuation made by hotel bookers should not be considered during a booking decision but rather as the bookers' memories of the value they perceived. After a satisfying or unsatisfying experience of online hotel booking, the role of the perceived value should be examined. Perceived value for money refers to the monetary benefits and sacrifices perceived by customers (Kim et al., 2013), whereas perceived value for time refers to customers' trade-off analysis of the cost of their time and the results they obtain (Jayasankaraprasad, 2014).

Although the positive link between satisfaction and loyalty has been extensively studied, the relationship is not as strong as expected (Chang and Wang, 2011). Loyalty implies satisfaction, but satisfaction is not loyalty (Jung and Yoon, 2012). For instance, a guest may be satisfied with his/her stay in a hotel because his/her expectations are met. However, such satisfaction does not guarantee

that he/she will repeat the experience or recommend the hotel to friends and relatives. Personal factors, such as perceived value, can moderate the translation between satisfaction and loyalty (Chang and Wang, 2011). The relationship between satisfaction and loyalty is strongest when customers feel that their current business vendor provides a relatively high overall value compared with its competitors. For instance, if a satisfied hotel booker perceives high value towards a website or mobile app, then he/she will be inclined to continue using such channel for hotel booking. In the mobile Internet era, an improved perception on the value for money or time will likely enhance the translation of satisfaction to loyalty for hotel bookers.

The role of perceived value as a moderator appears contradictory in different studies. Perceived value is determined to strengthen the association between satisfaction and loyalty (Chang and Wang, 2011). However, in a recent tourism research (Pilelienė and Grigaliūnaitė, 2014) it was found to weaken the effect of satisfaction on loyalty. The preceding arguments are used as bases to propose that perceived value for money and time affects the strength of the relationship between satisfaction and loyalty, possibly advancing the understanding of the satisfaction–loyalty link at the post-purchase stage.

H4a: Perceived value for money considerably moderates the relationship between satisfaction and loyalty.

H4b: Perceived value for time considerably moderates the relationship between satisfaction and loyalty.

The differences between computer and mobile buyers are suggested in previous studies (Liang et al., 2017). Mobile business solutions are transforming how suppliers communicate with customers. Given features such as ubiquity, immediacy and localisation awareness, m-bookers can purchase products/services without the limitations of time and location (Shankar et al., 2016). Time-saving is one of the most important factors that influence people's choice of purchasing channel, particularly in the context of being 'on the move/road' (Kim et al., 2015). Therefore, the preferences and values of m-bookers should be distinct from those of e-bookers (Singh and Swait, 2017), that is, the levels of time sensitivity should be different.

Given the mobility of mobile tourism, perceived value for time is important for m-bookers, whereas perceived value for money is an essential element of online purchasing decisions. Consumers are likely to compare prices among websites and mobile apps for hotel booking. With the marketing trend through mobile channels, numerous companies are offering more appealing discounts in the mobile channel than in the PC channel to gain market share (Thomson Reuters Street Events, 2014). Additionally, people may balance the need to save money with the need to save time while travelling. The perceived value for money and time is assumed to differ when people book a hotel through computer websites or mobile apps.

H5a: Perceived value for money differs between booking through a computer website and a mobile app.

H5b: Perceived value for time differs between booking through a computer website and a mobile app.

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3. Methodology

3.1. Research instrument

A pre-test is conducted prior to the main survey to ensure the appropriateness of the research instrument. Four academic experts, four industry practitioners and four hotel bookers (two e-bookers and two m-bookers) with online booking experience are invited to assess the content validity of the preliminary survey items. A measurement of consumer satisfaction with three items is adopted from Bai et al. (2008) and Kim et al. (2015). Consumer loyalty is measured using a five-item scale based on the measurement items used in a previous research on repeat purchase behaviour (Pritchard et al., 1999). This construct has been successfully analysed within the m-commerce context (Lin and Wang, 2006). The measurement of website quality (i.e. usability and functionality performance) is adopted from Bai et al. (2008): usability (five items) and functionality (five items). A three-item scale that measures the perceived value for money is derived from Lin and Wang (2006). For the perceived value for time, a measurement scale composed of four items is adopted from the m-tourism research of Kim et al. (2015). A seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) is used to measure the items based on four factors: perceived value for money, perceived value for time, satisfaction and loyalty. Another seven-point Likert scale, ranging from 1 (not good at all) to 7 (very good), is employed for the functionality and usability performances.

The questionnaire is designed with three major parts based on the development of measurements: questions about the online booking experience of the hotel bookers, items that measure the perceived quality variables (functionality and usability), perceived value variables (perceived value for money and time), satisfaction and loyalty, and questions designed to obtain the respondents' demographic information. An initial questionnaire is developed in English after the construct domain is established. The English–Chinese and Chinese–English back-translation methods of Chan and Pollard (2001) are used to translate the English version to a Chinese (Mandarin) version.

The results of the pre-test prompt a few changes in the initial items of functionality and usability of Bai et al. (2008) by referring to the updated measurements from Ip et al. (2012) and Wang et al. (2015). Exploratory factor analysis (EFA), including a principal component method with varimax rotation, is performed to identify and confirm the underlying dimensionality. The KMO values are 0.962 and 0.95 for e-Booker and m-Booker, respectively. Bartlett's test of sphericity is significant, thereby suggesting the appropriateness for EFA. Moore and Fairhurst (2003) explained that items with factor loadings of 0.6 or above and cross-loadings below 0.3 should be included for further analysis. The items that cluster on the same factor suggest that factors 1 and 2 represent usability and functionality performance, respectively.

3.2. Sample and procedure

This study targeted 400 respondents for each group to achieve a meaningful effect size based on a population of over 5,000 people. A total of 431 and 401 usable responses from e- and m-

bookers, respectively, were collected, which exceeded the minimal sample size in accordance with SEM requirements (i.e. 25 items × 10 = 250). The main survey was conducted online via a professional Chinese survey website, Wenjuanxing (www.sojump.com). The samples of this study were mainly recruited from Wenjuanxing members who come from various regions in China. The members receive a website link to our survey page along with a brief introduction.

Two independent surveys were conducted from January to February 2017: one each for e-booker and m-booker data. In the e-booker survey, respondents were asked to answer a screening question: 'Have you ever booked a hotel room in the past 12 months via a computer website?' Only those who selected 'yes' could continue with the e-booker survey and would be asked to further indicate the specific computer website they commonly use (i.e. 'If yes, then please specify the website you use most often for hotel booking'). They were then required to answer subsequent questions based on their hotel booking experience through the mentioned website. For instance, to measure functionality performance, e-booker survey respondents were asked, 'Please express your perceived quality of the above website according to your experience of hotel booking online', such as on the item 'The reservation information on the website', from 1 'not good at all' to 7 'very good'. Similarly, for the m-booker survey, participants were asked whether or not they had booked a hotel room via mobile devices in the past 12 months, and only those who answered 'yes' were invited to continue with the m-booker questionnaire. Afterward, the m-bookers were asked to indicate the mobile app they commonly use for hotel bookings and answer the subsequent questions specific to their mobile app booking experience.

3.3. Data analysis

SPSS version 22 and analysis of moment structures (AMOS) 17.0 software are used for data analysis. Independent t-test is used to compare the differences between e- and m-bookers. The reliability and validity of each construct in the proposed conceptual model are tested, and EFA and confirmatory factor analysis (CFA) are conducted. Moreover, we apply SEM to test the proposed hypotheses with estimation through AMOS 17.0. We employ hierarchical regression analyses for the moderation effects of the perceived value variables.

4. Results

4.1. Profiles of the respondents

Table 1 shows the profiles of the respondents. Of the 431 e-bookers, approximately 47% are male, and the majority are between 26 and 35 years of age. Furthermore, most e-bookers hold a bachelor's degree or higher. Among the e-bookers, 40.6% earn 5,001–10,000 RMB per month (US$755–US$1510). By contrast, the sample of m-bookers (401) consists of 207 males and 194 females, and most m-bookers are relatively young. In terms of educational attainment, the majority of m-bookers hold at least a bachelor's degree. The income categories of m-bookers are evenly divided throughout the sample. The exchange rate at the time of data collection was approximately

6.62 RMB = US$1.00.

Table 1. Description of the respondents

		e-Booker (N = 431)		m-Booker (N = 401)	
Gender	Male	204	47.3%	207	51.6%
	Female	227	52.7%	194	48.4%
Age	16–25	64	14.8%	121	30.2%
	26–35	258	59.9%	237	59.1%
	36–45	84	19.5%	35	8.7%
	46–55	19	4.4%	5	1.2%
	56–65	4	0.9%	3	0.7%
	66 and above	2	0.5%	0	0.0%
Education	Secondary/high school or below	12	2.8%	4	1.0%
	College/university	284	65.9%	196	48.9%
	Postgraduate or higher	135	31.3%	201	50.1%
Monthly income (RMB)	≤1,000 (≈US$151)	2	0.5%	10	2.5%
	1,001–5,000	64	14.8%	73	18.2%
	5,001–10,000	175	40.6%	106	26.4%
	10,001–15,000	96	22.3%	92	22.9%
	>15,000 (≈US$2265)	94	21.8%	120	29.9%

4.2. Independent samples t-test

4.2.1 General comparison between e- and m-bookers

Statistically significant differences are noted in 14 of the items and four of the constructs (Table 2). Particularly, the constructs of loyalty (t = 2.031*), functionality (t = 2.480*), usability (t = 3.033**) and perceived value for money (t = 2.881**) are determined to be significantly different between e- and m-bookers.

Table 2. Comparison of items between e- and m-bookers

	Mean		*t-Value*
Items	*Computer*	*Mobile*	
Satisfaction	5.40	5.23	**1.788**
SAT1—with the website	5.41	5.26	1.569
SAT2—with my experience on the website	5.47	5.25	2.225*
SAT3—met my needs	5.32	5.19	1.268
Loyalty	4.95	4.78	**2.031***
LOY1—preference will not change	4.93	4.83	0.986
LOY2—difficult to change my beliefs	4.88	4.61	2.731**

LOY3—even if friends recommended another website, my preference will not change	4.46	4.24	2.140*
LOY4—buy from this website the next time	5.19	5.09	1.099
LOY5—intend to keep using this website	5.27	5.11	1.612
Functionality	5.30	5.09	**2.480***
FUN1—reservation information	5.39	5.16	2.450*
FUN2—product information	5.11	4.89	2.314*
FUN3—user-generated information	5.30	5.16	1.448
FUN4—surrounding area information	5.24	5.00	2.519*
FUN5—contact information	5.44	5.24	2.071*
Usability	5.28	5.02	**3.033****
USA1—language	5.24	5.09	1.666
USA2—layout and graphics	5.29	5.00	3.112**
USA3—information architecture	5.20	4.94	2.771**
USA4—user interface and navigation	5.29	4.97	3.336**
USA5—general	5.37	5.09	2.977**
Perceived value for money	5.34	5.10	**2.881****
PVM1—good value for money	5.24	5.02	2.394*
PVM2—price charges are acceptable	5.51	5.18	3.557***
PVM3—considered to be a good buy	5.28	5.08	2.141*
Perceived value for time	5.16	5.15	**0.117**
PVT1—time spent is less than that in other ways	5.06	5.14	−0.849
PVT2—time-saving transaction	5.29	5.17	1.239
PVT3—save more time	5.06	5.11	−0.454
PVT4—right choice if saving time is considered	5.24	5.19	0.467

Note: *p < 0.05, **p < 0.01, and ***p < 0.001.

Perceived value for money scored the highest mean value (mean = 5.34) for the computer group (with the exception of satisfaction, which is a dependent factor), whereas perceived value for time (mean = 5.15) scored the highest for m-bookers. The perceived value for money (mean = 5.34) of e-bookers is significantly higher than that of m-bookers (mean = 5.10).

4.2.2 Comparison of website and app quality

The results of the independent t-test validated that e- and m-bookers are substantially different from each other in most aspects of functionality and usability performance. E-bookers provide relatively higher marks than m-bookers (Figure 1) in the aspects of reservation (computer = 5.39, mobile = 5.16), product (computer = 5.11, mobile = 4.89), surrounding (computer = 5.24, mobile = 5), and contact (computer = 5.44, mobile = 5.24) information.
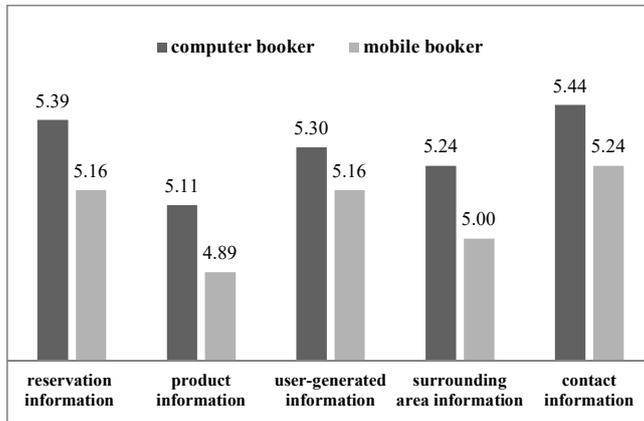
Figure 1. Comparison of functionality performance

Similarly, customers who reserved a hotel through a computer website also provided a higher score than those who used a mobile app (Figure 2) in several dimensions, such as layout and graphics (computer = 5.29, mobile = 5), information architecture (computer = 5.2, mobile = 4.94), user interface and navigation (computer = 5.29, mobile = 4.97) and general (computer = 5.37, mobile = 5.09). This result affirms the differences in perceived usability performance between the two cohorts.
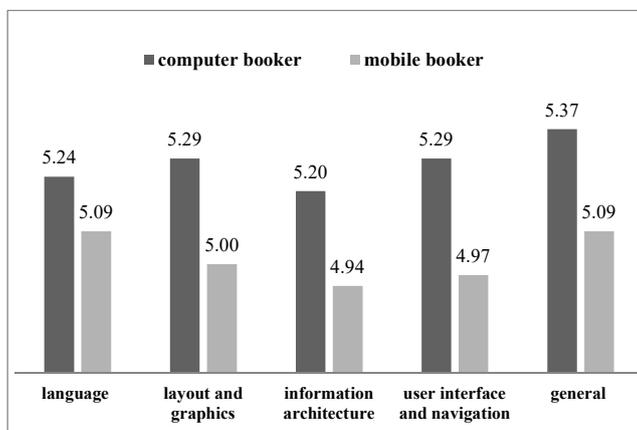

Figure 2. Comparison of usability performances

4.3. Measurement model test

The reliability tests for the e- and m-booker data confirm that the alpha coefficients of all constructs are above 0.8, which indicates good reliability (Nunnally and Bernstein, 1994). The CFA results of the e-booker data affirm a good model fit: Chi-square = 635.25 (p < 0.01), df = 260, $\chi2/df$ = 2.443; RMSEA = 0.058, CFI = 0.97, NFI = 0.95, TLI = 0.94 and IFI = 0.97. The measurement model also appears to fit the mobile booker data well based on the model fit indices: Chi-square = 804.06 (p < 0.01), df = 260, $\chi2/df$ = 3.093; RMSEA = 0.072, CFI = 0.95, NFI = 0.93, TLI = 0.95 and IFI = 0.96.

All the standardised factor loadings of each item on the underlying construct are significantly above the accepted threshold of 0.40 (Table 3). In addition, the average variance extracted (AVE) of each construct exceeded 0.50, which indicates appropriate convergent validity for the two data sets. The composite reliability values of the construct are also above the cut-off value of 0.7, which further confirms the convergent validity for both samples. Table 3 shows that most of the square roots of AVEs on the diagonal line are higher than the inter-correlations among the corresponding latent constructs, except for functionality, which suggests acceptable discriminant validity. The results of other assessments affirm the reasonable reliability and validity of the measurement of functionality. Accordingly, functionality is retained for further analysis (Singh and Singh, 2015). For the m-booker data, the results validate that all the square roots of the AVE values are higher than the correlations between the corresponding latent constructs, indicating good discriminant validity of the m-booker data.

Table 3. Confirmatory factor analysis

Items	e-booker			m-booker		
	Factor loading	AVE	Composite reliability	Factor loading	AVE	Composite reliability
Satisfaction		0.813	0.929		0.861	0.949
SAT1	0.931			0.929		
SAT2	0.887			0.962		
SAT3	0.886			0.892		
Loyalty		0.644	0.899		0.637	0.894
LOY1	0.752			0.703		
LOY2	0.732			0.694		
LOY3	0.654			0.598		
LOY4	0.920			0.957		
LOY5	0.918			0.967		
Functionality		0.708	0.924		0.686	0.916
FUN1	0.896			0.849		
FUN2	0.789			0.773		
FUN3	0.824			0.855		
FUN4	0.833			0.813		
FUN5	0.861			0.849		
Usability		0.778	0.946		0.829	0.960
USA1	0.891			0.874		
USA2	0.867			0.921		
USA3	0.862			0.908		
USA4	0.868			0.918		
USA5	0.912			0.930		
Perceived value for money		0.791	0.919		0.840	0.940

PVM1	0.891				0.929	
PVM2	0.885				0.917	
PVM3	0.892				0.903	
Perceived value for time		0.801	0.942		0.883	0.968
PVT1	0.878				0.942	
PVT2	0.905				0.958	
PVT3	0.884				0.923	
PVT4	0.913				0.936	

Table 4. Correlations among variables

	SAT	LOY	FUN	USA	PVM	PVT
e-booker, N = 431						
SAT	(0.902)					
LOY	0.736**	(0.802)				
FUN	0.849**	0.721**	**(0.841)**			
USA	0.871**	0.757**	0.876**	(0.882)		
PVM	0.813**	0.698**	0.854**	0.848**	(0.889)	
PVT	0.711**	0.680**	0.709**	0.753**	0.750**	(0.895)
m-booker, N = 401						
SAT	(0.928)					
LOY	0.668**	(0.798)				
FUN	0.772**	0.637**	(0.828)			
USA	0.762**	0.645**	0.815**	(0.910)		
PVM	0.713**	0.593**	0.759**	0.743**	(0.917)	
PVT	0.669**	0.569**	0.714**	0.715**	0.722**	(0.940)

Note: *$p < 0.05$ and **$p < 0.01$.
Numbers enclosed in parentheses and presented diagonally indicate the squared root of the AVEs. SAT = satisfaction, LOY = loyalty, FUN = functionality, USA = usability, PVM = perceived value for money and PVT = perceived value for time.

4.4. Structural model test

The structural model (e-booker) is characterised by the following indices: Chi-square = 393.48 ($p < 0.01$), df = 131 and $\chi2/df$ = 3.004, all of which connote an acceptable level of model fitness. The results of the other indices also supported the good fit of the model: RMSEA = 0.068, CFI = 0.967, NFI = 0.951, IFI = 0.967 and TLI = 0.911. The structural model of m-booker likewise demonstrates an acceptable fit: Chi-square = 531.66 ($p < 0.01$), df = 129, $\chi2/df$ = 4.121; RMSEA = 0.088, CFI = 0.949, NFI = 0.934, IFI = 0.949 and TLI = 0.939. Although the RMSEA value exceeds the recommended range of 0.05–0.08, the value is still within the 0.08–0.10 range, which is considered mediocre and acceptable (Browne and Cudeck, 1992). The results contend that functionality ($\beta = 0.371$, $p < .001$) and usability ($\beta = 0.594$, $p < .001$) performances positively influence the satisfaction level of e-bookers. As expected, functionality ($\beta = 0.578$, $p < 0.001$) and usability ($\beta = 0.300$, $p < 0.001$) performances positively affect m-Bookers' satisfaction. Thus, H1a and H2a are supported. As hypothesised, online bookers' satisfaction (computer booker: $\beta = 0.852$, $p < 0.001$; mobile booker: $\beta = 0.786$, $p < 0.001$) positively affect their loyalty towards a certain booking platform. Thus, H3 is supported as well.
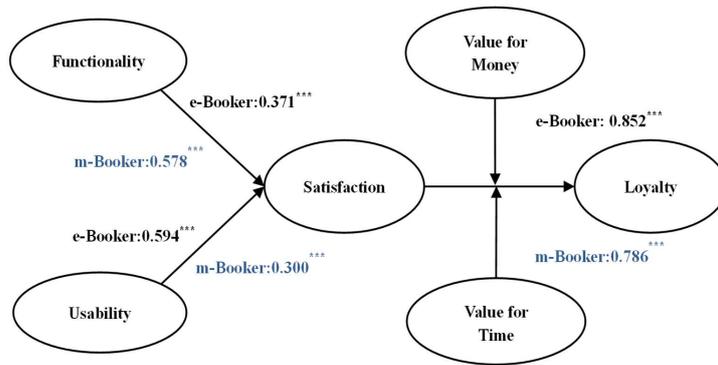
Figure 3. Results of the conceptual model

Note: *p < 0.05, **p < 0.01, and ***p < 0.001.

In the era of the mobile Internet, it is conceivable that a hotel booker may have both computer and mobile booking experience within a year. In consideration of the influence of past booking experience through one platform on the other (i.e. prior computer booking experience on the experience of mobile booking), particularly looking at whether computer/mobile booking experience would have a moderating effect on the structural relationships in the conceptual model would be interesting (Figure 3). As such, multi-group SEM moderation tests are conducted using AMOS. Initially, e-booker data are divided into two groups, with (387) and without (44) mobile booking experience; and m-booker data are split into two groups, with (268) and without (133) computer booking experience. Subsequently, the Chi-square value of the constrained model [e-booker: χ^2 (279) = 658.40, p < 0.01; m-booker: χ^2 (279) = 773.77, p < 0.01] and that of the unconstrained model [e-booker: χ^2 (262) = 634.30, p < 0.01; m-booker: χ^2 (262) = 753.73, p < 0.01] are compared. No significant Chi-square change is identified for all the paths, indicating that prior computer/mobile booking experience would not be an effective moderator for the structural relationships of the model (Ro, 2012). For e-bookers, no significant difference emerges between those with and those without mobile experience in the relationships of the proposed model. For m-bookers, whether they had computer booking experience or not would not bring a considerable influence on the strengths of the structural relationships.

4.5. Moderating effect

For the assessment on the moderating effects of the satisfaction–loyalty link, the hierarchical regression models are tested with the perceived value for money and time as moderators. Consistent with previous studies, the demographic variables are controlled, such as gender, age, education and income, which are indicated as related to customer satisfaction and loyalty (Balabanis et al., 2006; Karatepe, 2011). However, these variables are outside the scope of the

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current study and were thus controlled to avoid statistical confounds. In each table, Model 2 shows the main effects of the satisfaction–loyalty link. Models 4 and 6 present the results of the hypothesised moderators (Tables 5 and 6, respectively). No moderating effects of the perceived values (for money or time) are determined in the e-booker models. When product satisfaction and perceived value for money are added in the regression model, the results do not show a considerable effect on the interaction terms ($\beta = -0.049$, $p > 0.05$), and the adjusted R^2 of Model 4 do not change. For the other hypothesised moderator, the perceived value for time and the coefficient of the satisfaction × perceived value for time are also insignificant ($\beta = -0.004$, $p > .05$). Thus, the results from the e-booker sample do not support H4a and H4b. By contrast, the moderation hypotheses are supported in the m-booker model. The regression coefficients of the satisfaction × perceived value for money ($\beta = 0.099$, $p < 0.05$) and satisfaction × perceived value for time ($\beta = 0.105$, $p < 0.05$) are significant. Moreover, when the interaction terms are added into the regression model, the adjusted R^2 significantly increases accordingly. Therefore, H4a and H4b are supported by the m-booker sample.

Table 5. Moderation effect of the perceived value variables

Variables	Loyalty					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender	0.095*	0.091**	0.097**	.099**	0.089**	0.089
Age	0.055	−0.016	−0.024	−0.021	0.008	.008
Education	0.026	0.050	0.047	0.041	0.028	.028
Income	−0.042	−0.017	−0.015	−0.015	0.007	.007
Satisfaction		0.741***	0.495***	0.513***	0.516***	0.518***
PVM			0.303***	0.321***		
PVT					0.312***	0.313***
Satisfaction * PVM				−0.049		
Satisfaction * PVT						−0.004
Adjusted R^2	0.003	0.549	0.579	0.579	0.595	0.594
ΔR^2		0.546	0.03	0	0.016	−0.001
F	1.316	105.6***	99.6***	85.6***	106.1***	90.8***

Note: *p < 0.05, **p < 0.01, and ***p < 0.001. PVM = Perceived value for money and PVT = perceived value for time.

Table 6. Moderation effect of perceived value variables

Variables	Loyalty					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender	0.142**	0.056	0.051	0.052	0.055	0.055
Age	0.120*	0.003	−0.028	−0.042	−0.007	−0.025
Education	−0.092	0.023	0.035	0.038	0.024	0.027
Income	−0.102	−0.025	−0.032	−0.025	−0.026	−0.021
Satisfaction		0.662***	0.489***	0.439***	0.514***	0. 458***
PVM			0.251***	0.232***		
PVT					0.223***	0.209***
Satisfaction * PVM				0.099*		
Satisfaction * PVT						0.105*
Adjusted R^2	0.039	0.444	0.473	0.477	0.470	0.475
ΔR^2		0.405	0.029	0.004	−0.007	0.005

F	5.06***	64.94***	60.81***	53.07***	60.22***	52.74***

Note: *p < 0.05, **p < 0.01, and ***p < 0.001. PVM = perceived value for money and PVT = perceived value for time.

5. Discussions

Although prior studies contended that the online purchasing behaviours of e- and m-bookers are likely different (Kim et al., 2015; Singh and Swait, 2017), existing research has yet to compare these behavioural differences using empirical evidence. Hence, one of the major objectives of the present study is to compare the differences between computer and mobile bookers with regard to hotel reservation. Table 7 depicts the similarities and differences between computer and mobile bookers on the basis of the results.

Table 7. Similarities and differences between e- and m-bookers

		e-bookers	**m-bookers**
Similarity	▪	Functionality and usability performances positively affect customer satisfaction.	
	▪	Satisfaction positively affects customer loyalty.	
	▪	General design is most important in terms of usability.	
	▪	Contact information is the second most important in terms of functionality.	
Difference	▪	Usability is the most influential factor that predicts satisfaction.	▪ Functionality is the most influential factor that predicts satisfaction.
	▪	Reservation information is the most important in terms of functionality.	▪ User-generated information is the most important.
	▪	Perceived value for money and time show no moderating effect on the satisfaction–loyalty link.	▪ Perceived value for money and time significantly moderate the satisfaction–loyalty link.
	▪	Perception of functionality and usability and perceived value for money significantly differ between the two samples.	
	▪	No difference exists between e- and m-Bookers with regard to perceived value for time.	

Collectively, the results of e- and m-Bookers prove that perceived quality is crucial in affecting the attitudes of online hotel bookers, with functionality and usability performance being important antecedents of satisfaction. This finding is consistent with the results of prior research on website evaluation (Bai et al., 2008; Wang et al., 2015). In addition, satisfaction is determined to be positively related to customer loyalty in both samples, which also corresponds with previous research (Jung and Yoon, 2012; Xu et al., 2015). e- and m-Bookers consider general design as the most important dimension of usability, and contact information as second in terms of functionality performances.

Several differences are identified between e- and m-Bookers with regard to hotel booking. Initially, the results corroborated that e- and m-Bookers substantially differ in their perceptions on

the functionality and usability performance of websites and mobile apps. Particularly, e-Bookers provide a higher priority to usability compared with the functionality performance of hotel booking websites. By contrast, m-Bookers value functionality more than usability performance of mobile apps. The results of e-Bookers are consistent with findings from previous research that affirmed usability performance is the most influential factor of customer satisfaction (Bai et al., 2008; Stienmetz et al., 2013). The high information demand during travel can explain why functionality performance is determined to be important for m-Bookers. This finding also corresponds with certain arguments on mobile marketing. Specifically, as the sense of immediacy and convenience are the fundamental motivations for mobile purchasing, the limited physical space of mobile devices provides a critical challenge in transferring tethered web content to a mobile app, thereby suggesting a more important role of functionality for mobile booking (Liang et al., 2017; Shankar et al., 2016).

The results further suggest that e-Bookers are considerably interested in reservation information with regard to functionality performance, whereas m-Bookers value user-generated information the most. This difference can be attributed to the unique features of mobile devices. Given the narrow screen of mobile devices, hotel bookers may need additional information to facilitate their decision making when navigating a mobile app, such as feedback information from other hotel guests. Additionally, one of the driving factors for the use of mobile channels is searching the reviews and experiences of other customers instantaneously while on the move (Shankar et al., 2016).

The results of the independent samples t-test assert that loyalty, perceptions of functionality and usability and perceived value for money are substantially different between e- and m-Bookers. The outcome shows that hotel bookers perceive better value for money when booking a hotel through a computer website, which can be attributed to the strong searching capability and comprehensive choices with respect to computer website booking (Singh and Swait, 2017). Moreover, the considerably higher scores of functionality and usability performance of computer websites compared to those of mobile apps revealed the advantages of computer websites. This finding conforms to the assertion by Xu et al. (2014) that concluding mobile channels will substitute desktop-based channels is inappropriate. The desktop still has its apparent advantage, that is, a larger screen, which allows marketers to present their products/services with visual complexity, where mobile channels can serve as a valuable complement.

Another important difference between e- and m-Bookers is the role of perceived values (for money and time) as moderators. No moderating effect of perceived value variables is found among e-Bookers in the relationship between satisfaction and loyalty, whereas the results of m-Bookers confirmed that perceived value for money and time substantially moderate the satisfaction–loyalty link. The difference of these moderating effects can be attributed to the mobility of mobile hotel booking. When people are on the move, saving time is particularly important and this perception can enhance the transformation of customer satisfaction and loyalty.

6. Conclusions

6.1. Theoretical contributions

This research addresses the recent call for a deep understanding of online bookers' behavioural differences in multi-channel environments (Kim et al., 2015; Singh and Swait, 2017). The current study not only sheds light on the similarities and differences between e- and m-Bookers in booking hotel reservations but also reveals a limited effect on prior purchasing experience via one channel on the other. This finding suggests important implications for future research that delves into the behaviours of online consumers across desktop and mobile channels.

Previous studies on e-Tourism have identified usability and functionality performance as two important dimensions for evaluating website quality (Bai et al., 2008; Wang et al., 2015). However, these dimensions were not previously investigated as important components of mobile app quality, and information regarding app quality remains under-researched (Shankar et al., 2016). The current study extends existing literature by providing insights for mobile app quality and the methods by which app quality relates to customer satisfaction and loyalty. This study also contributes to extant literature on the theoretical framework of quality–satisfaction–loyalty. First, although previous discussions on this framework in IT-related literature already exist (Lin et al., 2014; Lin and Wang, 2015), the present research takes a step forward by empirically validating the framework in the context of mobile hotel booking. Second, the current study advances the understanding of the quality–satisfaction–loyalty link. Extensive studies have investigated the interrelationships among the constructs of the quality–satisfaction–loyalty framework (Lin and Wang, 2015; Wu and Li, 2017), wherein perceived value is investigated either as a predictor or mediator. However, the moderating role of perceived value at the post-purchase stage in transforming satisfaction to loyalty has generally been overlooked. This study highlights the role of perceived value for money and time as moderators on the satisfaction–loyalty link after using a mobile app, which can be regarded as another intellectual contribution to the research on e-Tourism.

In addition, prior research either investigated perceived value merely from the perspective of value for money (Ali et al., 2013; Ponte et al., 2015) or regarded perceived value as a black box, the effects of which are normally measured as a whole (Xu et al., 2015). Given that time-saving is asserted as a critical factor that cannot be neglected in an e-commerce environment (Kim et al., 2015), this study breaks down the perceived value of an online booker into perceived value for money and time. Thus, this research also contributes to improving the measurement of perceived value in e-Tourism literature.

6.2. Managerial implications

With regard to practical implications, this study assists industry practitioners in gaining an improved understanding of online markets. The results present the similarities and differences between e- and m-Bookers, knowledge of which can be beneficial to marketers who aim to improve operational efficiency, particularly in the allocation of marketing efforts across desktop and mobile channels.

If tourism and hospitality companies plan to remain competitive in the online market, striving for customer satisfaction remains to be of utmost importance to obtain long-term profits. The findings of this study verify that, whether for computer website or mobile apps, enhancing the

functionality and usability dimensions is vital for industry practitioners. The results also confirm that general design, reservation and user-generated information are influencing factors for e- and m-Bookers.

The preference of m-Bookers for functionality suggests that industry practitioners should attach importance to the information quality provided by an app when designing hotel reservations. User-generated information on mobile apps is also a key that tourism and hospitality operators should consider. Information provided from experienced customers is critical for first-time visitors because tourism-related products are a type of experience that cannot be assessed in advance. User-generated information is powerful and influential. Thus, app operators should encourage customers to share their information and comments as much as possible by providing easy access for m-Bookers to share online reviews. Furthermore, proper incentives can be offered. To minimise the undesirable effect, hotel managers may consider responding to the negative reviews on time and carrying on with service recovery if the problem stated is serious.

People use only a few apps regularly; thus, the competition among different hotel booking apps can be rather fierce (Singh and Swait, 2017). For tourism and hospitality operators who intend to be more competitive in the mobile market, another important managerial implication is emphasising value for money as well as time. A satisfactory experience in mobile hotel booking that does not lead to customer loyalty towards a mobile app should be noted. Hence, leaving m-Bookers with an impression of high-quality service with fairly modest cost is important for industry practitioners to consider. For m-Bookers who are relatively under time pressure, a perception of time-saving is likewise a key element that can facilitate the conversion of satisfaction into long-term commitment.

6.3. Limitations and future research

This study has a few limitations that should be acknowledged, which inevitably suggest directions for future research. First, although this study compares the behavioural differences between e- and m-Bookers, only two groups are targeted for investigation: e-Bookers (who have, but are not limited to, computer website booking experience) and m-Bookers (who have, but are not limited to, mobile app booking experience). To further determine the differences in hotel booking preferences, future research may consider comparing three groups: e-Bookers (computer websites), m-Bookers (mobile apps) and online bookers (computer and mobile channels).

Second, only a cross-sectional study is conducted, possibly resulting in causality that is similar to other cross-sectional research. A longitudinal study that analyses the dynamic evolution of these relations would be beneficial to tracing developmental patterns, in particular, the long-term effect of perceived quality and value variables on customer loyalty. Moreover, data are collected online using the convenient sampling method. Although the professional survey website used in this study covers nearly all regions in China, the sampling remains limited to a geographical structure owing to the uneven economic development in the country. Common method variance has been proven as non-threatening to this study based on the single-factor test recommended by Podsakoff et al. (2003). However, future studies may consider obtaining data from different sources and using varying response formats to control for possible common method biases.

This study mainly investigates functionality and usability as important dimensions of perceived quality to evaluate the quality of websites/mobile apps based on the quality–satisfaction–loyalty framework. Future research should continue to examine other factors, such as enjoyment, reputation and familiarity of a booking channel, all of which could influence online booker's evaluation of websites/mobile apps. Furthermore, although self-reported loyalty is considered acceptable and has been extensively used in previous studies, future research could use a substantially objective measure of customer loyalty, such as customer share development or data of service usage, which can both provide a highly robust assessment.

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