



**THE EFFECTS OF THE MOBILE TOURISM WEBSITE QUALITY ON CUSTOMER
INTENTION TO REUSE AND RECOMMEND**

A PhD thesis submitted by

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Abstract

The widespread mobile technology usage is becoming influential in travellers' decisions and behaviour, consequently drawing considerable attention from researchers including the influences of mobile apps' quality, the prerequisites to enhance customer satisfaction and ultimately building customer loyalty. However, the high attrition rate renders customer loyalty questionable for travel apps since an average travel app loses more than half of its users within a month. There is limited academic research on the reuse and recommend of the use of mobile travel websites. This research bridges the literature gap by applying the updated Delone and McLean Information System Success Model to identify the factors affecting consumers' perception of mobile tourism website service quality. Moreover, this study investigates the differences in consumer's intention to reuse and recommend.

The study adopts a mixed research method including a comprehensive literature review of tourism website quality evaluation, individual interviews and survey about post-purchase behavioural intentions influenced by mobile website quality. Results from 330 online survey responses reveal that the conceptualisation of mobile website quality has no significant differences across online travel agencies and direct suppliers. For mobile website quality, factors of information have stronger impact to service than system quality. Likewise, the findings of mobile consumers suggest that in their post-purchase behavioural intentions, consumers' high tendency to reuse other websites from the same firm was not equivalent to their recommendations.

This research offers both academic and practical contributions. Academically, with the majority of studies separately examining website quality from three constructs of information, system and service qualities, this study initially proposed that mobile website quality should be examined by service quality which presents the overall information system success and is affected by information and system qualities. Secondly, this study also proposes a formative

model to assess mobile tourism website quality by demonstrating its relationship with post-purchase behavioural intentions. Hence, this study has implications to formative studies in the digital marketing literature. Practically for the industries, it presents recommendations on the improvements of mobile website quality and mobile consumer's post-purchase behavioural intentions to reuse and recommend. This study also provides directions for companies to improve their current mobile websites and strategies to promote them.

Keywords: Mobile website quality, service quality, perceived value, intention to reuse, intention to recommend

Certification of Thesis

This thesis is entirely the work of Yin Yi (Janelle), Chan except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

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Table of Contents

Abstract.....	i
Certification of Thesis.....	iii
Acknowledgements.....	iv
Table of Contents.....	v
List of Figures.....	viii
List of Tables.....	ix
Abbreviations.....	x
Chapter 1: Introduction.....	1
1.1 Background.....	1
1.2 Problem statement.....	2
1.3 Aims and objectives of the research.....	3
1.4 Significance of the study.....	4
1.4.1 Expected theoretical contribution.....	4
1.4.2 Expected contribution to practice.....	5
1.5 Chapter summary.....	6
Chapter 2: Literature review.....	7
2.1 Mobile commerce in tourism.....	7
2.2 Mobile tourism websites.....	9
2.3 Mobile tourism website quality.....	9
2.3.1 Previous studies on consumer perceptions of mobile tourism website quality.....	14
2.4 Online consumer behaviour.....	15
2.4.1 Impact of tourism website quality on consumer behaviour.....	15
2.5 Consumer behavioural intentions.....	19
2.5.1 Intention to reuse.....	19
2.5.2 Intention to recommend.....	20
2.6 Perceived value.....	23
2.7 Measurement of information system success.....	24
2.7.1 Information quality.....	27
2.7.2 System quality.....	27

2.7.3	Service quality.....	28
2.8	Conceptualisation of mobile website quality construct.....	29
2.9	Correlation of service quality and perceived value.....	30
2.10	Interrelationships among service quality, perceived value and behavioural intention ..	30
2.11	Proposed conceptual framework.....	31
2.12	Chapter summary.....	32
Chapter 3: Methodology.....		33
3.1	Rationale and objectives of the study.....	33
3.2	Research design.....	34
3.2.1	Stage one: Basic measurement development.....	34
3.2.1.1	Measurement of information quality.....	34
3.2.1.2	Measurement of system quality.....	35
3.2.1.3	Measurement of service quality.....	36
3.2.1.4	Measurement of perceived value.....	37
3.2.1.5	Measurement of behavioural intention.....	38
3.2.2	Stage two: Qualitative interviews.....	39
3.2.2.1	Sample of the interviews.....	39
3.2.2.2	Interview process.....	40
3.2.2.3	Interview findings.....	41
3.2.3	Stage three: Pre-test and pilot test.....	41
3.2.3.1	Pre-test.....	41
3.2.3.2	Pilot test.....	42
3.2.4	Stage four: Quantitative survey.....	42
3.2.4.1	Population and sample.....	42
3.2.4.2	Sample and Data collection.....	43
3.3	Data analysis.....	44
3.3.1	Data screening.....	44
3.3.2	Descriptive analysis.....	44
3.3.3	Formative measurement model data analysis.....	45
3.4	Partial least squares structural equation modelling.....	45
3.5	Validation of formative measurements.....	46
3.6	Chapter summary.....	46

Chapter 4: Data analysis and results	48
4.1 Descriptive analysis.....	48
4.2 Normality analysis.....	50
4.3 Outer model evaluation	52
4.3.1 Convergent validity	53
4.3.2 Indicator collinearity, weight, significance and relevance	53
4.4 Inner model evaluation.....	58
4.5 In-sample predictive power	58
4.6 Out-sample predictive power	59
4.7 Summary of hypothesis testing	61
4.8 Model goodness-of-fit.....	63
4.9 Multiple group analysis	64
4.10 Importance-performance map analysis	67
4.11 Chapter summary	68
Chapter 5: Discussion and conclusion	69
5.1 Overall model performance.....	69
5.2 Research objective 1: Identify factors affecting consumers’ perceptions of mobile tourism website quality.	70
5.3 Research objective 2: Examine the relationships among mobile website service quality, perceived value and behavioural intentions	73
5.4 Research objective 3: Investigate the differences in consumer post-purchase behaviour between mobile OTAs and direct suppliers’ website.....	76
5.5 Theoretical contributions.....	77
5.6 Practical implications	79
5.7 Limitations and future study	81
5.8 Chapter summary	83
References	84
Appendix 1: English online survey	105
Appendix 2: Chinese online survey	110

List of Figures

Figure 1: D&M original IS Success Model (1992).....	25
Figure 2: Updated D&M IS Success Model (2003).....	26
Figure 3: Conceptual Framework	31
Figure 4: Path Coefficients of Conceptual Model	63

List of Tables

Table 1: Summary of studies relating to website quality evaluations and consumer perceptions	10
Table 2: Summary of studies on tourism website quality and multi-criteria decision-making approach	12
Table 3: Summary of studies relating to mobile tourism website quality and customer perceptions	14
Table 4: Studies relating to stages 1 to 3 of the consumer decision making process	16
Table 5: Studies relating to stages 4 to 5 of the consumer decision-making process	18
Table 6: Measurement of Information Quality	35
Table 7: Measurement of system quality	36
Table 8: Measurement of service quality	36
Table 9: Measurement of perceived value	38
Table 10: Measurement of behavioural intention	39
Table 11: Demographic Profile of the Respondents for Each Subsample	49
Table 12: Means, Standard Deviations and Normality of Indicators for OTAs Subsample.....	50
Table 13: Means, Standard Deviations and Normality of Indicators for Direct Suppliers Subsample	51
Table 14; Original measurement model: VIF, Outer Weight and Loading Significance	55
Table 15: Modified measurement model: VIF, Outer Weight and Loading Significance.....	56
Table 16: Inner VIF values	58
Table 17: Results of R ² and Q ²	59
Table 18: RMSE Results of PLS-SEM and LM	60
Table 19: Results of hypothesis testing	62
Table 20: MICOM Results of the Conceptual Model.....	65
Table 21: Multi-group comparison test results	66
Table 22: Importance-Performance Map Analysis for ‘reuse’ and ‘recommend’	67

Abbreviations

ICTs: Information and communication technologies

CRS: Computer Reservation System

GDS: Global Distribution System

LBS: Location Based Service

METG: Mobile electronic tourist guide

AMTG: App-based mobile tour guide

NFC: Near-field communication

GPRS: General Packet Radio Services

OTA: Online travel agency

WOM: Worth of mouth

eWOM: Worth of mouth on the Internet

PV: Perceived value

D&M: DeLone and McLean

IS: information system

e-SQ: e-commerce, service quality

SEM: Structural equation modelling

PLS: Partial least squares

R²: Coefficient of determination

Q²: Cross validated redundancy

MAE: Mean absolute error

Chapter 1: Introduction

This chapter introduces mobile technology and discusses its emergence in the tourism industry. Amid the proliferation of mobile devices, smartphones particularly offer advanced capabilities that amount to PC-like functionality. Nonetheless, little is known concerning how mobile website quality affects consumer post-purchase behaviour. To fill the research gap, the chapter identifies three research objectives building on the basis of the research problems as well as the research gaps. The chapter concludes with the expected theoretical and practical contributions.

1.1 Background

The rapid development of Information and Communication Technologies (ICTs) over the past decade has a remarkable global influence on tourism (Buhalis & Law, 2008). The impacts of the Internet and ICTs are combined and amplified when travellers are equipped with mobile technologies (Fesenmaier & Xiang, 2014; Lamsfus et al., 2015). The latter which includes smartphones, tablets and mobile applications have become the primary devices for users to access the Internet and have thus become an indispensable part of consumers' daily lives (Wang et al., 2012). Statista (2019) estimated the users of mobile devices to be more than 5 billion people, and over half of these connections are smartphones. On average, adults spend over four hours per day using their smartphones, along with the related apps for information searching, social networking and communications (Comscore, 2017). Particularly in tourism, various technological advancements including Computer Reservation System (CRS), Global Distribution System (GDS) (Werthner, 2003), Location Based Service (LBS) (Saravanan & Ramakrishnan, 2016), mobile electronic tourist guide (METG), app-based mobile tour guide (AMTG) and mobile payment using near-field communication (NFC) have brought consumers' widespread adoption of mobile technologies for travel-related purposes (Law et al., 2018). The smartphone's ubiquitous capability to link people to remote information repositories, exchanging location-based data and social information has rapidly made it a powerful tool for tourists (Dickinson et al., 2014). Tourists using the mobile Internet can make a reservation for hotels, flights and tours, to name a few, at any time and wherever Internet is accessible (Wang & Wang, 2010). In a global study of 9,200 travellers across 31 top outbound tourism countries, 76% of travellers use their mobile device as their top

travel accessory (EyeforTravel, 2017). Among them, over one third use mobile device to book a pre-trip hotel room, and up to 80% of them make a last-minute booking (Criteo, 2018).

Many tourism industry studies assert that as a result of improved mobile-based experiences, the shift from offline to online booking can become pronounced in the coming years (Rauch et al., 2017; Travelport, 2017). Correspondingly, figures in Statista (2016) showed that in 2016, global online travel sales totalled US\$564.87 billion, and this figure is projected to grow to US\$817.54 billion in 2020. Moreover, in view of the arrival of 5G (5th generation network) which speeds up to a hundred times faster than the current 4G in 2020 (Skourletopoulos et al., 2017), the increase in mobile tourism sales is predicted to reach 50% by 2021 (Poundstone, 2017), and the mobile booking volume would soar to US\$108.75 billion in 2021 (Sheivachman, 2017). With mobile tourism's expanding market potential and competition, an in-depth understanding of how ICTs affect consumer behaviour is a critical foundation for businesses to identify and develop effective and sustainable marketing communication strategies (Xiang et al., 2015).

1.2 Problem statement

There are two significant research gaps of this study. Firstly, the influential combination of ICTs and mobility in hospitality and tourism has attracted academic attention on mobile tourism since the turn of the millennium (Liang et al., 2017). Previous scholars focused mostly on mobile tourism applications (apps) due to its prevalence (Kim & Kim, 2017), and academic research scarcely investigated mobile tourism website (Groth & Haslwanter, 2016; Wong et al., 2018).

The worldwide statistics showed that in 2017, consumers downloaded 178.1 billion mobile apps to their connected devices, and this figure is projected to increase to 258.2 billion in 2022 (Statista, 2018). With the growing market of mobile tourism as well as its fierce competition, a plethora of academic interest attention on mobile tourism apps have emerged, including motivations for adoption (No & Kim, 2014; Kim, 2016), impact on tourists' travel patterns and behaviours (Lamsfus et al., 2015; Murphy et al., 2016), consumer's perceptions (Park & Tussyadiah, 2017; Choi et al., 2018) and consumer attitudinal and behavioural loyalty (Kim et al., 2014; Ozturk, Bilgihan, et al., 2016; Colomo-Palacios, García-Peñalvo, et al., 2017; Wu, 2018). However, literature has emphasised that the consumers would not be persistently loyal to the tourism apps due to the rising fatigue in app usage. Figures from Travelport Digital (2019) reveal that nearly 65% of tourism apps were deleted one month after installation. App users also relinquish using

apps in the long run due to possible privacy leakage (Linton & Kwortnik, 2015). As most of the apps require users to disclose their personal information (e.g. geographic location, mobile phone numbers) for installation, the privacy leak concern has been dreaded to cause a potential invasion of personal privacy (Chin et al., 2018).

Researchers in recent years have slowly realised the popularity of mobile websites substituting apps. A few of the studies have examined the usability of mobile tourism website derived from the basis of desktop computer (Groth & Haslwanter, 2016; Wong et al., 2018). The general concept of usability refers to the degree of ease with which users can use a website (Bai et al., 2008). Nevertheless, studies rarely proposed about whether the adaptability of the previous models based on the usability of desktop computer can be entirely applied for mobile website. Thus, it poses the following research question: are mobile consumers highly concerned of more or fewer aspects other than usability? Consequently, the current study alternatively advocates to apply mobile website quality which is a broader concept encompassing usability (Kuan et al., 2008), system quality, information quality and service quality into this study (Lin, 2007).

The second research gap is that very few academic researchers have investigated the influence of mobile tourism website quality in relation to the consumer post-purchase behaviour, especially customer behavioural intention to reuse and recommend. Moreover, previous research pattern in the field of consumer decision-making process mostly focused on the early stages, including consumers' needs recognition (Loureiro, 2015; Tseng & Wang, 2016), consumer information search (Law & Ngai, 2005; Bai et al., 2008) and alternative evaluation (Kardaras et al., 2013; Hao et al., 2015). Apparently, there are relatively fewer studies conducted on the post-purchase behaviour which refers to the behavioural intentions and any consumer behaviours after purchase (Elkhani et al., 2014; Abou-Shouk & Khalifa, 2017). Hence, with the rising popularity of mobile website and the relatively fewer studies on the post-purchase behaviour, this study compares two most common mobile websites of direct suppliers and intermediaries and examines how mobile website quality impacts on consumer's intention to reuse and recommend is necessary for both academic and practical contributions.

1.3 Aims and objectives of the research

This research aims to bridge the gap in the literature on the impact of mobile tourism website quality and customer perceived value on customers' post-purchase behavioural intention to reuse

and recommend. This study is one of the few studies that focus on mobile tourism websites. Despite the several comparisons and debates regarding mobile tourism websites and mobile tourism apps (Papadopoulos et al., 2017), previous research has predominantly explored mobile applications (Kim & Kim, 2017). The research targets the consumers who have previously used mobile tourism websites to purchase travel products and investigates the factors influencing mobile website service quality. This process will be achieved by understanding perceived value between the mobile website service quality and the consumer post-purchase behaviour. More specifically, the objectives of this study are as follows:

RO1) to identify factors affecting consumers' perceptions of mobile tourism website service quality.

RO2) to examine the relationships among the mobile tourism website service quality, consumer perceived value and intention to reuse and recommend.

RO3) to investigate the differences in consumer post-purchase behaviour (reuse and recommend) between two groups of mobile tourism websites, including direct suppliers and intermediaries.

1.4 Significance of the study

As mentioned above, despite of the fact that loyal customers in mobile tourism is not conventional nowadays especially for mobile applications, it is uncommon to find a specific study, proposing the alternatives to examine customer intention to reuse and recommend driven by the mobile website quality. Therefore, with the emerging mobile website usage, this is crucial to examine how mobile website affects consumer's intentions to reuse and recommend. Practically, this research can be justified on two levels for its significances in two aspects. Firstly, it theoretically contributes to a better understanding of digital marketing and consumer behaviour. Secondly, it provides practical guidance on post-purchase intentions to industry practitioners and direct suppliers. Each contribution is now examined in further detail.

1.4.1 Expected theoretical contribution

This study contributes to theory in several ways. The study contributes to the digital marketing literature by extending understanding of how mobile website service quality influences consumer perceptions. Existing literature in mobile tourism focuses more on tourism apps (Law et al., 2018) than mobile tourism websites. Different from the previous studies that focus on usability on the

basis of traditional computer desktop (Groth & Haslwanter, 2016; Wong et al., 2018), this study is among the first to propose the examination and comparison of two different groups of mobile tourism websites of direct suppliers and intermediates' website quality which represents a border concept including usability, information quality, system quality and service quality (Lin, 2007; Kuan et al., 2008). Additionally, this research proposed a new model on the basis of the updated DeLone and McLean Information System Success Model to examine mobile website quality.

This research further contributes to the body of knowledge on online consumer behaviour by determining the post-purchase intentions of reuse and recommend. This first attempt strengthened the understanding by showing how the consumer post-purchase behaviours are potentially influenced by mobile website service quality and mediated by perceived value. From a theoretical viewpoint, this study potentially arouses further academic attention on mobile website quality, particularly in catching up with various emerging mobile technologies and the ever-changing characteristics of mobile website market.

1.4.2 Expected contribution to practice

This study contributes to practice in several ways, especially for hospitality and tourism industry practitioners. The study focuses on the consumer post-purchase behaviours, which have been considered the most effective form of marketing in terms of cost efficiency (Harrison-Walker, 2001). Research in marketing showed that attracting new customers is more expensive in terms of time and financial costs than retaining existing consumers (Zeithaml et al., 1996). Therefore, this study provides support and assistance to industry practitioners in ensuring the long-term relationship with their current consumers. From the consumer's perspective, the intentions to reuse and recommend are based on consumers' previous positive purchase experiences (Hellier et al., 2003); whereas from the provider's perspective, such intentions are based on cost efficiency. The latter perspective draws a comparison between the cost of attracting new customers and retaining existing consumers. Apart from the current industry practitioners, this study also facilitates those interested in entering the mobile market. This study potentially provides useful information to various practitioners, including direct suppliers and intermediates. Particularly, under the current fierce competition of mobile market, this study provides a rigorous understanding on the factors

influencing mobile website quality to new business developers in creating and developing highly effective mobile websites.

1.5 Chapter summary

This chapter summarised how the speedy uptake of mobile technology has radically altered the hospitality and tourism industry and its significant research gap of mobile tourism website quality. As technology is continuously moving with fast forward upgrades, a growing number of smartphone users exist. The prevalence of mobile apps has consequently drawn substantial attention from researchers, including the determinants of adoption, impact on tourists' travel patterns and behaviours, the perceptions of usage, the prerequisites to enhance customer satisfaction and ultimately to build consumer loyalty. However, prolonged customer loyalty to tourism apps is doubtful nowadays due to the rising fatigue in tourism app usage. Different tourism industry reports consistently showed that more than 50% of travellers uninstalled the apps only after a month and prefer to use mobile websites instead. Unlike the mobile tourism with its feature of readiness, tourism apps frequently require users to provide personal information for installation. From the user's perspective, an apprehension of the potential invasion and leak of personal privacy arises. Regardless of the fact that loyal consumers in mobile tourism apps are no longer conventional, only a small proportion of the academic research has primarily proposed to examine the mobile tourism website. Different from the previous researchers who have applied usability to examine mobile website as a principal goal, this study is an alternative attempt to apply website quality which has a broader conceptualisation into investigation. Furthermore, this study initially puts forward the modified model on the basis of the updated DeLone and McLean Information System Success Model in examining how the mobile tourism website quality affects the post-purchase intention to reuse and recommend.

Chapter 2: Literature review

Chapter two presents an overview of the current literature relating to mobile commerce in tourism. The discussion is followed by a review of studies that focus on website quality in tourism and its impact on online consumer behaviour from a consumer perspective. Based on the discussion of the foregoing theoretical background, research gaps are identified, followed by an explanation of the selected research constructs. Perspectives are determined by applying the updated version of the DeLone and McLean Model. The chapter then examines how the factors affecting mobile website quality influence mobile consumers' intentions to reuse and recommend. It concludes with a proposed conceptual model.

2.1 Mobile commerce in tourism

The generation of mobile commerce and websites has started since 2003, due to the advancement of smartphones (Raento et al., 2009). Mobility and accessibility of the Internet have brought many changes to travellers. One of the major changes is the consumer's ability to reserve travel-related services at any time and wherever the mobile Internet is available (Wang & Wang, 2010). This type of real-time access to information is modifying the behaviour of tourists before, during and after their travel process (Linton & Kwortnik, 2015). Google Phocuswright (2017) found that over 1 in 3 travellers across countries are interested in using digital devices to research or reserve travel-related services. The active and wide-ranging mobile usage has globally and continuously generated several revenues. Statista (2019) reported that the largest market segment in eTravel is the online mobility services segment, with a market volume of US\$520,227 million in 2019. This mobile market volume is further estimated to continue growing with an average rate of approximately 8.1% per year till 2023 (Statista, 2019). The mobile 'superstorm' has dramatically changed tourist behaviours and business processes in the field of hospitality and tourism, thus ascribing a revolutionised meaning to the latter (Wang, Xiang, & Fesenmaier, 2016).

Extant literature about mobile tourism has focused generally on mobile tourism apps due to its prevalence (Kim & Kim, 2017), and a paucity of exhaustive research focuses on mobile tourism website. Globally, the number of mobile apps downloaded is growing from 178.1 billion in 2017 to the projected number of 258.2 billion in 2022 (Statista, 2018). Particularly in tourism, statistics showed that 82% of travellers downloaded tourism apps (Travelport Digital, 2018), and the

revenue of mobile tourism apps over the past 180-day lifetime value amounts to US\$29.42 per user which is higher than the other popular apps (e.g. games and shopping) (Statista, 2018). With all the ever-increasing figures, a plethora of academic interest and attention on mobile tourism apps have been observed. Related research includes consumer motivation to adopt mobile tourism technologies (Morosan, 2014; Okumus & Bilgihan, 2014; Ozturk, Bilgihan, et al., 2016; Fong et al., 2017) and the higher tendency of experiential consumers to use mobile technologies for travel purposes (de Oliveira Nunes & Mayer, 2014; Minazzi & Mauri, 2015).

However, the emerging commonness of mobile tourism website should not be disregarded. The Cornell Hospitality Report points out that although most users are willing to download specific tourism apps onto their mobile devices, nearly half of those are subsequently deleted, and the travellers nowadays prefer to use mobile tourism websites than apps (Linton & Kwornik, 2015). The explicit statistics signify that the average travel apps lose 64% of its users only after 30 days of their signing up; that number climbs up to 76% after 60 days and subsequently to 82% after 90 days (Subramanian, 2018). The predominance of mobile website is due to its relatively easy accessibility and adaptability in which web browsers can be found in most mobile devices to any mobile-friendly websites; whereas apps can only be used after installation and frequently involve consumer privacy information for adoption (Linton & Kwornik, 2015; Papadopoulos et al., 2017).

The importance of mobile tourism technologies is further emphasised in its importance to tourism suppliers. These technologies are considered an important source of competitive advantage to tourism supplier (Bertan et al., 2016). For example, mobile learning applied at various customer-service departments of a hotel can overcome the limitations of traditional training methods (i.e. classroom and outdated handouts) and increase the effectiveness of employee training (Kim & Kizildag, 2011). To conclude, Lin (2017) summarised that the critical success factors for mobile technology implementation comprise both top management support and consumer needs. Thus, discovering factors relating to mobile website quality viewed from consumers' perspectives provides crucial information to management for their technical design and improvement. Apparently, the body of knowledge on mobile tourism websites deserves further research focus, and this study is replenishing the insufficiency of such research. In an attempt to investigate the quality of websites on online consumer post-purchasing behaviour, the next section focuses on research on mobile tourism websites.

2.2 Mobile tourism websites

With the development of mobile technologies, mobile-optimised design uses the height and width dimensions of mobile devices and for large screen applications appearing in a fixed size frame; alternatively, rescaling to fill the entire window can eliminate such discrepancy and maintain the mobile-compatibility and inclusiveness (Patel et al., 2015). The mobile-optimised design has been widely adopted by travel websites, consequently enabling travellers to search and consume travel products within a few and relatively easy steps for a smaller touch screen (Ozturk, Bilgihan, et al., 2016). For mobile tourism websites, two common categories exist, namely, the travel product direct suppliers (e.g. hotels) and intermediaries (e.g. online travel agencies) (Law et al., 2015). The intermediary websites of online travel agency (OTA), also known as a third-party booking site, is the main driving force for streamlining electronic distributions (Carroll & Siguaw, 2003). OTAs allow customers to determine the best deals for hotel rooms by browsing hotel products and comparing rates across multiple booking websites. Morosan and Jeong (2008) pointed out that selling rooms on OTA websites could cause brand erosion and room disparity across different distribution channels. Accordingly, various direct supplier websites emerged. Hotel brands such as Hyatt, Marriott, Starwood and Hilton established their own branded websites and encouraged customers to make direct online reservations (Zhang et al., 2015). By analysing the recent literature of hospitality and tourism website, Sun et al. (2017) stated that suppliers nowadays largely rely on mobile technology in e-strategic management to distribute their travel-related products, thus emphasising the importance of future research on mobile tourism website quality. Following the literature, mobile website in this research is defined as any travel website that has the mobile-optimised web design available on mobile devices. The two common categories of mobile tourism websites also provide an impetus for the third research objective to investigate the differences in consumer's intention to reuse and recommend from OTAs and direct suppliers.

2.3 Mobile tourism website quality

Website quality is a pivotal concept in electronic commerce (e-commerce) as the consumers' perceptions of website quality directly drive their purchase intentions (Bai et al., 2008). Researchers have asserted a correlation between website quality and e-business performance (Bevanda et al., 2008). Technically, website quality is defined as the overall excellence or effectiveness of a website delivering intended messages to its viewers (Jeong et al., 2003). This

definition is in line with the related literature from 1992 to 2007 conducted by HernáNdez et al. (2009) that website quality is mostly measured by information quality, system quality, ease of use, privacy and security. However, such technical focus on the definition received criticism because it overlooks the significance of consumer needs. Scholars explicate that website quality should be consumer oriented as it is the extent to which a website’s features meet consumers’ needs and reflect overall superiority of the website (Chang & Chen, 2008). The current study supports the notion of focusing on consumers’ perceptions, adopts Chang and Chen’s (2008) definition and determines mobile tourism website quality from the consumer perspectives.

Fierce competition and continuous ICT development have prompted tourism practitioners to adopt web-based marketing strategies to enhance their competitive advantages among consumers (Sun et al., 2017). For consumers, websites facilitate their access to travel-related information and assist them in making purchase decisions online (Ladhari & Michaud, 2015). Since the mid-1990s, numerous researchers have presented different methods premised on consumers’ perceptions for measuring tourism website quality (Sun et al., 2017). Table 1 chronologically presents and summarises an overview of the related studies.

Table 1: Summary of studies relating to website quality evaluations and consumer perceptions

Source	Main Findings
Murphy et al. (1996)	The most effective hotel websites are those that give the consumer the easiest, most rewarding access to relevant and related information.
Martin (1999)	Low fares on OTA websites has many restrictions including longer staying time, booking day and quota.
Kaynama and Black (2000)	OTA websites need to compete with better navigation, design and responsiveness in a timely manner.
Jeong and Lambert (2001)	Four constructs of information quality, perceived usefulness and attitudes are found to be significant indicators to predict the customers’ purchase behaviour using the lodging websites.
Wan (2002)	User interface of hotels and tour wholesalers websites is rated highest among the three categories while variety of information” was the lowest rated.
Richard R Perdue (2002)	Overall ski resort website quality perceived by customers is affected by visual attractiveness of the website, the information content of the website and existing resort images.
Jeong et al. (2003)	Information satisfaction of lodging websites is a powerful determinant of online behavioural intentions. Website quality is an important antecedent of information satisfaction.
Kim and Lee (2004)	Information content is found to be the most crucial dimension of OTAs website in explaining the overall level of customer satisfaction.

Kline et al. (2005)	The major strength of the bed and breakfast websites is their attractiveness, but user-friendliness, marketing effectiveness, and technical aspects are needed to improve.
Ham (2005)	For a content analysis, all the top 25 limited service chain lodging websites have a better score than three points on a 5-point Likert scale based on the 7 criteria.
Law and Ngai (2005)	For Hong Kong based OTA websites, travellers' overall expectations of performance is higher than usability.
Baloglu and Pekcan (2006)	The luxury hotels in Turkey are not utilizing the Internet to its full potential and effectively e-marketing their hotels regardless of the hotel type.
Kim et al. (2007)	Finding low fares is the most critical followed by security of the importance of OTA website attributes.
Park and Gretzel (2007)	The identified dimensions of destination websites largely correspond with previous study with commonly used dimensions except for visual appearance and trust.
Bevanda et al. (2008)	OTA website has a problem of information overload which should not happen, thus OTA websites should instead use a minimalistic approach to the design of the home page with eye-catching.
Hu (2009)	Consumers of OTA websites are mainly concerned about assurance or trust, responsiveness, continue improvement and tangibility.
Lathiras et al. (2010)	Agro-travel, inn and ecotourism websites are lack of interaction facilities and conversation sections. Thus, personalized options with user personal accounts that focus on the design, information, interaction and overall website quality are needed.
Tsang et al. (2010)	OTA website functionality is the most powerful factor which significantly influences online customers' evaluation of overall satisfaction and repurchase intention.
Panagopoulos et al. (2011)	Relative good ratings are found for the performance indicators of the Greek chain hotel sector in most or all of the dimensions.
Tanrisevdi and Duran (2011)	For OTA websites comparison, Spain and Greece are rated as more effective than Turkey. Aesthetical features, structure, and navigation are rated with the highest scores whereas information contents were not considered as sufficient.
Zhong et al. (2014)	China's attraction websites are the best in accessibility and they need the improvement of the interaction and commerce functions.

Murphy et al. (1996) were the first researchers to investigate the use of websites in the hospitality environment. They had identified 36 websites from different types of hotels and found that consumers value the easy access to relevant information as the most important factor of website quality. After this first attempt, research more specific to other functional aspects has taken shape. To measure the quality of various tourism websites, researchers use features such as website background (Kaynama & Black, 2000); design (Kaynama & Black, 2000; Kim et al., 2007); attractiveness (Richard R Perdue, 2002; Kline et al., 2005; Bevanda et al., 2008); colour, layout/graphics, visual appearance (Jeong et al., 2003; Law & Ngai, 2005; Park & Gretzel, 2007; Bevanda et al., 2008) and information content (Richard R Perdue, 2002; Wan, 2002; Jeong et al.,

2003; Kim & Lee, 2005; Law & Ngai, 2005; Park & Gretzel, 2007; Bevanda et al., 2008) for measurement. This earlier literature reflects that from the 1990s to early 2000s, tourism websites were still in the developing stage, and these studies focused more on website quality in relation to consumer satisfaction. With all the earlier literature supporting the importance of website quality as well as the increasing demand of tourism website, researchers move further towards consumer-oriented features of tourism websites. Hu (2009) firstly established an extensive list of website quality with 12 features focusing on consumers' perspective. This paper advocating the significance of e-service quality has inspired other researchers to join the discovery. Following this main stream, Lathiras et al. (2010) and Tsang et al. (2010) adopted other website quality measures into studies, particularly the measures of interaction of service; at that time, customer relationships were considered the new indicators which emphasised that website functionality, as one of the key factors of website quality, was heavily relying on consumer's perspective. Hence, later studies have attempted to link up the areas of functionality and consumers' perspective (Panagopoulos et al., 2011; Tanrisevdi & Duran, 2011). Panagopoulos et al. (2011) used 12 factors influencing functionality and concluded that these functional indicators are based on consumer perceptions from Greek consumers. Tanrisevdi and Duran (2011) attempted to be more specific and applied five factors with the same conclusion. Different from most of the researchers exploring the website quality of hotels or OTAs, Zhong et al. (2014) found that China's attraction website remained in its infancy stage at that time, and the improvement of functionality was needed to increase capability of accommodating tourists' needs.

Recent researchers tend to apply an enhanced multi-criteria decision-making approach to measure website performance, that is, to combine criteria, such as content, design, functionality and usability in their investigations (Sun et al., 2016; Ye et al., 2016; Jeon & Jeong, 2017; Jiménez-Barreto & Campo-Martínez, 2018). Table 2 presents the recent literature using a multi-criteria decision-making approach.

Table 2: Summary of studies on tourism website quality and multi-criteria decision-making approach

Authors (Year)	Main Findings
Sun et al. (2016)	Information quality is the most important attribute in the website design of OTA. Attributes of ease of use, personalization, and flexible reservations enhancing the simplicity of websites are evaluated by customers for website quality.

Ye et al. (2016)	For China OTA website, attributes of security and customer relationships are the strongest influence on customer satisfaction. User involvement is important when measuring consumer satisfaction and the perceived importance of quality attributes.
Jeon and Jeong (2017)	Functionality of hotel websites influences the perceived website service quality Customer emotional reactions toward website's aesthetics and customization elements significantly affect perceived service quality, reputation dimension and perceived website service quality.
Jiménez-Barreto and Campo-Martínez (2018)	Direct relationships are found between official destination website quality, website attitudes and willingness in online co-creation experiences. Website attitudes partially mediates relationships between destination website quality and willingness in online co-creation experiences.

Since 2016, the contemporary studies on mobile website quality indicate the significant research gap that exists in this area of study. Viewed from the previous literature from the 1990s to the mid-2010s, website quality emphasising both functionality and consumers' perspective is reiterated. However, contemporary studies have the similar practice that is individually looking at one specific type of tourism websites without comparing among various types of websites (Sun et al., 2016; Ye et al., 2016). The studies of Sun et al. (2016) and Ye et al. (2016a) showed the impact of OTAs' website functions and information quality to consumers' decision making and perceived service quality. Jeon and Jeong (2017) followed the resembling ideas by examining how hotel website's functionality influences the perceived website service quality. The results show that high-quality tourism websites are providing various consumer-oriented functions, such as personalisation (Sun et al., 2016) and attributes of customer relationships (Ye et al., 2016). Jiménez-Barreto and Campo-Martínez (2018) attempted an uncommon approach to look at official destination website; their findings show that website quality, website attitudes and willingness in online experiences all have a positive relationship.

In summary, all of the aforementioned studies investigated one type of tourism website in their studies, thereby highlighting the limited research in this field of study. In general, the majority of the existing literature tend to conduct independent investigation of the following six types of websites: 1) hotel, 2) resort, 3) OTA, 4) lodging, 5) destination and 6) travel-related websites. Most of these studies relate to desktop websites, with limited inclusion of mobile websites. None of the studies investigated whether consumers perceive a difference between the types of websites. Therefore, the research investigating the differences in mobile OTAs and direct suppliers fills this gap.

2.3.1 Previous studies on consumer perceptions of mobile tourism website quality

Despite the bunch of studies mentioned previously on tourism website quality, a dearth of research focuses on mobile tourism website quality. Table 3 shows a summary of the relevant studies in this area. Few studies relate to mobile websites, and these studies focus further on consumer's perceived usability and the desktop computer (Stienmetz et al., 2013; Groth & Haslwanter, 2016; Wong et al., 2018).

Table 3: Summary of studies relating to mobile tourism website quality and customer perceptions

Authors (Year)	Research Factors	Main Findings
Stienmetz et al. (2013)	Content, Ease of Use, Made-for-the-Medium features, and Emotional appeal.	Design elements of ease of use and content contribute are most significantly related to the overall usability of mobile destination management organisation websites.
Groth and Haslwanter (2016)	5 measures: Task success time, Page views, Task success level, Self-evaluation questionnaire for overall-usability and satisfaction.	By comparing to adaptive mobile tourism websites, responsive mobile web design is found to provide a more comfortable and smooth user experience. However, responsive design fails to distinguish itself in satisfaction and perceived usability.
Wong et al. (2018)	2 dimensions: mobile website usability, functionality	Users prefer an easy-to-use mobile website design, structure, and simple information on hotel mobile websites. Overall, users perceive all functionality dimensions as crucial.

The studies shown in the above table proportionately investigated the technical aspects of website quality. For instance, Stienmetz et al. (2013) reviewed the design elements of mobile destination management organisation websites and found that ease of use contributes most significantly to the overall usability. Advancing the study of Stienmetz et al. (2013), Groth and Haslwanter (2016) applied an engineering approach to inspect how responsive mobile tourism website varies from its adaptive counterpart. Their results reveal that the former provides a more comfortable and smooth user experience than the latter (Groth & Haslwanter, 2016). Among the fewer publications of mobile website quality, Wong et al. (2018) investigated the significance of the dimensions and attributes of hotel mobile website from the users' perceptions. This study examined a singular type of mobile website, with limited focus on different types of websites. How the quality of different

types of websites influences consumer perceptions and their online consumer behaviour remains unclear.

2.4 Online consumer behaviour

Online consumer behaviour (a.k.a. online shopping behaviour) refers to the process of purchasing products or services via the Internet (Malik & Guptha, 2013). The online consumption process consists of five stages analogous to those associated with traditional shopping behaviour: problem recognition, information search, evaluation of product options, purchase decision and post-purchase support (Malik & Guptha, 2013). Understanding online consumer behaviour can serve as a critical foundation for businesses to identify and develop effective and sustainable marketing communication strategies (Xiang et al., 2015). Globally, researchers have shown interest in investigating online consumer behaviour (Cho & Jialin, 2008; Hasan, 2010; Ahmad & Khan, 2015; Ahmad et al., 2016). In the context of online platforms, website quality has been identified as an influencing factor determining online consumer behaviour (Deng & Poole, 2012; Cebi, 2013; Ahmad et al., 2016). Researchers have acknowledged that the vital role of consumers' perceived quality affects their online consumption behaviour (Park et al., 2007; Zhou et al., 2009; Lu et al., 2010; Othmani & Bouslama, 2015), and the related research has been extensively studied in tourism (Sun et al., 2017).

2.4.1 Impact of tourism website quality on consumer behaviour

Theoretically, analysing online consumer behaviour is a complex nonlinear phenomenon, as it affects attitude towards behaviour throughout the consumer decision-making process (Lee & Chen, 2010; Hwang & Jeong, 2016). Accordingly, this research follows the approach of Darley et al. (2010), using the Engel-Kollat-Blackwell (EKB) model with five stages of decision-making process as a backdrop to review the related studies of tourism website quality on consumer behaviour. The five stages (including needs recognition, information search, alternative evaluation, purchase decision and post-purchase behaviour) of EKB model are also widely accepted as evidenced in various consumer behaviour textbooks (Assael, 1998; Blackwell et al., 2006; Mothersbaugh, 2015). Tables 4 and 5 provide a summary of research in the five stages of consumer online decision-making process. Table 4 provides a summary on the relevant studies relating to tourism website quality and stages 1 to 3 of the consumer decision-making process.

Table 4: Studies relating to stages 1 to 3 of the consumer decision making process

Authors (Year)	Findings
Stage 1: Needs recognition	
Tang et al. (2012)	The characteristics of destination website design significantly influence consumers' needs cognition.
Loureiro (2015)	Visual appeal, ease of use and information, are the most important components in forming a perception of the island destination website quality.
Tseng and Wang (2016)	OTA website quality and source credibility effectively persuade customers to buy travel products.
Stage 2: Information search	
Law and Ngai (2005)	Perceptions of travellers toward the usability of OTA websites fail to meet their expectations, particularly in terms of the dimension of information architecture.
Bai et al. (2008)	Travel website quality with good information quality has a direct and positive impact on customer satisfaction, and that customer satisfaction has a direct and positive impact on purchase intentions.
Law et al. (2008)	Functionality factors of a destination or travel website include purchase, service or product, destination, quality and contact information.
Qi et al. (2009)	Perceived website usefulness of Chinese users and international users are similar and they generally perceived presentation is an important attribute.
Kardaras et al. (2013)	Consumers perceive hotel website design with all the information they need as a service priority.
Hao et al. (2015)	Customers judge OTA websites in terms of certain important criteria instead of the weighted average of every pertinent factor.
Stage 3: Evaluation of alternatives	
Kim et al. (2004)	To improve website performance in evaluating alternatives, the marketing methods of convention centre website need to improve.
Law and Hsu (2005)	When choosing different hotels, information of hotel room rates provided by hotel website is perceived as the most important attribute.

Schmidt, Cantallops, and dos Santos (2008)	There is a circular effect between hotel website characteristics and consumer demands. Hotel inefficient responsiveness resulted in consumers to use traditional tourist distributors instead.
Kim and Njite (2009)	Korean convention centres websites need to improve usability especially in customer and marketing related aspects.
Li and Wang (2011)	US official tourism websites are not able to effectively adopt and manage information technology to support more sophisticated business operations.
Kim and Kim (2010)	User friendliness and security are regarded as the two most important critical success factors for hospitality and tourism websites.
Dickinger and Stangl (2013)	Content quality and usefulness are the two most important criteria among all the dimensions of tourism and destination websites.
Ting et al. (2012)	Features facilitating Internet-based applications and innovative features can be added into hotel websites to improve website utilization.
Escobar-Rodríguez and Carvajal-Trujillo (2013)	Two significant positive relationships are found between the size of the hotel and the quality of information provided.

In Table 4, research about stage 1 ‘need recognition’ pay attention on how different website factors arouse consumer’s interest (Tang et al., 2012; Loureiro, 2015; Tseng & Wang, 2016). Noticeably, considerable research has been inclined to study consumer decision stage 2 ‘information search’ and stage 3 ‘evaluation of alternatives’. Research of these two stages concentrates on how consumers can easily find useful information (Law & Ngai, 2005; Bai et al., 2008; Law et al., 2008; Qi et al., 2009; Kardaras et al., 2013; Hao et al., 2015), what and how the alterative websites affect consumer’s evaluation (Law & Wong, 2003; Kim et al., 2004; Law & Hsu, 2005; Schmidt, Cantallops, & Santos, 2008; Kim & Njite, 2009; Kim & Kim, 2010; Li & Wang, 2011; Ting et al., 2012; Dickinger & Stangl, 2013; Escobar-Rodríguez & Carvajal-Trujillo, 2013). Table 5 summarises the relevant studies relating to tourism website quality and stages 4 and 5 of the consumer decision-making process.

Table 5: Studies relating to stages 4 to 5 of the consumer decision-making process

Authors (Year)	Findings
Stage 4: Purchase decision	
Law and Hsu (2006)	Online purchasers view reservations information as more important than online browsers when making purchase decision.
Law et al. (2009)	Respondents who only viewed China-based travel websites have an average usability performance. No significant difference is found between “e-lookers” and “e-buyers.”
Wang et al. (2015)	Hotel website quality is a strong predictor of eTrust which then also mediates the relationship between website quality and consumers’ online booking intentions.
Ali (2016)	Hotel website quality influences customers’ perceived flow, which in turn, influences their satisfaction and purchase intention. Perceived flow mediated the relationships between hotel website quality, customer satisfaction and purchase intentions.
Dedeke (2016)	Website design quality, perceived product quality and perceived information-task fit have predictive relevance for purchase intention.
Stage 5: Post-purchase behaviour	
Elkhani et al. (2014)	E-satisfaction is found to mediate the relationship between customer disconfirmations and consumer e-loyalty.
Abou-Shouk and Khalifa (2017)	Online process are affecting customers’ expectations, their confidence when making purchasing decisions and increase their loyalty to businesses.

Research related to stage 4 ‘purchase decision’ places particular attention on how different website factors related to website quality affects consumer’s final decision to purchase (Law & Hsu, 2006; Law et al., 2009; Wang et al., 2015; Ali, 2016; Dedeke, 2016). Viewed from the overall research pattern in this field, relatively fewer studies are conducted on stage 5 ‘post-purchase behaviour’ which refers to the behavioural intentions and any consumer behaviours after purchase (Elkhani et al., 2014; Abou-Shouk & Khalifa, 2017). Nonetheless, post-purchase behaviour should not have been omitted as its profound importance to the firm is recognised for its influence on repeat purchases and word-of-mouth recommendations (Jacobsen, 2018) driving the long-term business success (Han & Kim, 2010). Apparently, a dearth of research exists on the final online consumer decision-making stage. Therefore, this research intends to bridge the gap in the literature

by determining how website quality of different types of websites influences consumer behavioural intentions.

2.5 Consumer behavioural intentions

Behavioural intentions connote an individual's perceived likelihood to behave in a specific way (Fishbein & Manfredo, 1992; McKnight et al., 2002) and are important indicators for future consumer behaviours (Lai & Chen, 2011). Ajzen and Fishbein (2000), in their highly cited theory of reasoned action, argued that behavioural intentions are the best and most proximal psychological predictor of actual behaviour as behavioural intentions are the signals that reflect whether a customer will continue to utilise a company's services or switch to the other provider (Zeithaml et al., 1996). Although many researchers classified behavioural intentions of repeat purchase and continued use as the results of customer loyalty (Yee & Faziharudean, 2010; Chiu et al., 2013; Kumar Roy et al., 2014; Ruiz-Mafe et al., 2014), such behavioural-based loyalty has been disputed as it fails to distinguish an ambiguity persisting between spurious and action loyalties (Leventhal et al., 2006; Wetsch, 2006). Spurious loyalty exists when customers display behavioural but not attitudinal loyalty (Dick & Basu, 1994). Thus, Ajzen (2002) believes that prediction of behavioural intentions is more precise than action as customers may purchase under constraints instead of actual preferences. Therefore, this research focuses on the post-purchase intentions from an attitudinal perspective and analyses consumer post-purchase behavioural intentions to reuse and recommend.

2.5.1 Intention to reuse

Intention to reuse or continued use relates to the postadoption behaviour of consumers. Li et al. (2006) definition of intention to reuse from the user's perspective is the same as repetitive visits to and continuous use of a preferred website due to a deeply held commitment, despite situational influences and marketing efforts that can potentially cause switching behaviour. Several existing factors affect intention to reuse website including user's perceived content value, perceived context value, perceived infrastructure value and promotional value of e-retail websites (Beldona et al., 2006; Xu & Liu, 2010). Research has affirmed that the intention to reuse website positively affects customers' intentions to buy, thereby converting visitors into purchasers and even repeat purchasers (Lin et al., 2010; Wang, 2010; Xu & Liu, 2010). Indeed, intention to reuse is deemed a

vital factor for a website's survival, profitability and consumer retention in the marketplace (Parthasarathy & Bhattacharjee, 1998; Reichheld & Scheffer, 2000; Limayem & Cheung, 2008; Chou et al., 2010; Kim, 2012).

The importance of intention to reuse in the different types of tourism context has been studied diversely. Chung et al. (2015) who studied destination management organisation website confirmed that the significance of website qualities can continuously attract tourists to hotel websites and ultimately boost visit intentions. For the tourism website qualities, Kao et al. (2005) investigated the relationship of website satisfaction and intention to reuse by using national tourism organisation websites. In their study, information and system qualities were used as independent variables to test consumer satisfaction concerning the website content. The findings exhibit that users are looking for trip planning information including local maps, transportation and accommodation. Therefore, information quality is related more to website satisfaction than system quality, and website satisfaction has a positive influence on intention to reuse or recommend the website to other users (Kwon, 2009; Chung et al., 2015).

Similarly, in the field of mobile tourism, Choi et al. (2011) examined users' intention to reuse mobile apps of theme park services and found that a high level of consumer satisfaction leads to the decision to continuously reuse services. Fong et al. (2017) attempted to specifically examine the psychological aspects composing customer satisfaction by adopting 'Unified Theory of Acceptance and Use of Technology' as theoretical basis. Their study reveals that the cognitive anchors of performance expectancy, effort expectancy, social influence and facilitating conditions are positively associated with intention to reuse mobile hotel apps. Disregarding the type of mobile tourism apps, Choi et al. (2011) concluded that as long as the users are satisfied with mobile services, the likelihood to reuse will be high. As developed by the previous literature, the current research designates that intention to reuse refers to the likelihood of the mobile consumers adopting the same or related mobile tourism website again based on their previous usage experience.

2.5.2 Intention to recommend

Conceptually, the intention to recommend is the same as the positive word of mouth (WOM) that refers to the likelihood that respondents will recommend the product or service to others (Maxham III, 2001). The reasons for positive WOM are associated with a positive consumer's affective

elements of satisfaction and pleasure that motivate consumers to share experiences with others (Neelamegham & Jain, 1999). During consumer purchase decision making, the inexperienced consumer relies on WOM communication, especially when they are purchasing an unknown product (Bansal & Voyer, 2000). Particularly in the intangible tourism industry, WOM influences travellers' purchasing behaviour due to the experiential nature and perishable aspects of tourism products (Luo & Zhong, 2015; Park & Nicolau, 2015). For example, the service quality of hotels cannot be evaluated before consumption.

With the rapid growth of Web 2.0 applications and communication platforms which allow the creation of even more sophisticated collaboration platforms through users' sharing information (Ladhari & Michaud, 2015), WOM on the Internet (eWOM) has further influenced the tourism sector (Cantalops & Salvi, 2014). Given the growing ease of access in the Internet and the ability to produce online content, consumers now place confidence in online reviews from experienced travellers when forming a travel decision (Sparks & Browning, 2011; Xie et al., 2011; Ye et al., 2011). Numerous tourism websites (e.g. TripAdvisor, Expedia, Hotel.com) and social networks (e.g. Facebook, Twitter) provide platforms for tourists to share textual descriptions (i.e. opinions, comments) and photos related to personal travel and holiday experiences (Papathanassis & Knolle, 2011). These platforms influence the preferences and choices of travellers (Papathanassis & Knolle, 2011; Ye et al., 2011; Wilson et al., 2012) and help them diminish the level of perceived risk and uncertainty during the travel decision making (Bronner & De Hoog, 2011; Liu & Park, 2015).

Extant literature showed that both psychological and technical aspects would trigger tourist's intention to recommend. Psychologically, satisfied tourists are more likely to recommend the destinations or hotels to others (Bigne et al., 2001; Chen & Tsai, 2007), whereas consumers' perceived satisfaction mediates the relationship between tourists' emotions and intention to recommend (Walsh et al., 2011). Therefore, intention to recommend is an indicator of positive behavioural outcome from satisfactory tourist experiences (Grappi & Montanari, 2011; Prayag & Ryan, 2012). Moreover, for tourists with the intrinsic motivations, such as self-expression, self-discovery frequently manifests to generate recommendations (Gretzel & Yoo, 2008; Bronner & De Hoog, 2011). Whilst technically, the technology readiness is also likely to enhance users' propensity to repurchase and intention to recommend (Ranaweera et al., 2005; Y. Wang et al., 2017). Research highlights that the use of smartphones and tablets has rendered the constant sharing of opinions and information easy for consumers (Allsop et al., 2007). Similarly, the

increased variety of travel apps has also empowered tourists to access information and share their experiences anytime and anywhere (Kennedy-Eden & Gretzel, 2012; Pedrana, 2014). Travel apps of TripAdvisor, Expedia and Yelp are the examples offering mobile community services that allow users to seek travel-related information through the sharing of experienced travellers (Molinillo et al., 2016; Wang, Xiang, Law, et al., 2016). Additionally, innovation of mobile technology in Augmented Reality apps used in theme parks is found to have strong impacts on the content, personalised service and system quality that result in user satisfaction and intention to recommend visiting other theme parks (Jung et al., 2015). Given the foregoing studies, the current research suggests that both positive WOM and eWOM are related to the examination of intention to recommend.

From the conceptual perspective, intentions to reuse and recommend are on par with the concept of consumer loyalty in mobile tourism. Mobile loyalty (m-loyalty) defined as consumers' intention to revisit a mobile website or mobile app, resulting in repeat purchasing behaviour (Cyr et al., 2006) is particularly important in today's competitive market (Deng et al., 2010). Previous studies concerning consumer loyalty in mobile tourism have proven that perceived benefits including ubiquity, informativeness, personalisation (Kim et al., 2016), convenience, compatibility and ease of use (Ozturk, Bilgihan, et al., 2016) are the common consumer perceptions of mobile apps, whereas specifically perceived benefit varies from travellers to travellers (Adler & Blue, 1998). For hotel customers, perceived ease of use and convenience are the main factors to customer satisfaction (Ozturk, Bilgihan, et al., 2016). For example, Starwood Hilton hotel apps allowing guests to check in/out by themselves can bring satisfaction of convenience to users (Pereira et al., 2016; Pereira et al., 2017).

For independent travellers, perceived informativeness and personalisation are the key determinants. Studies found that mobile apps with location-based service can provide personal information and recommendations by detecting user's position; such function is well appreciated by travellers and thus induces higher intention to revisit the destination (Tiru et al., 2010; Colomo-Palacios, José García-Peñalvo, et al., 2017). Studies also revealed that price sensitivity moderately relates to m-loyalty; results are drawn from online tourism group buying and experienced users with the influencing factors including transaction cost, preview, trust (Kim et al., 2014) and switching cost (S.-N. Zhang et al., 2019). Other than the post-purchase studies, Fong et al. (2017) alternatively adopted the unified theory of acceptance and use of technology to predict consumer's

intention to reuse mobile hotel apps; results aligning with the previous studies showed that facilitating conditions and effort expectancy relating to consumer perception towards mobile apps' characteristics are the main positive predictors to m-loyalty. Founded on the previous literature and similar to the concept of customer loyalty, the current research is enriching m-loyalty from the scope of mobile tourism website quality. The next section investigates perceived value in relation to consumer intentions to reuse and recommend in the tourism context.

2.6 Perceived value

Perceived value (PV) has been defined as the consumer's overall assessment of the trade-off between benefits and sacrifices perceived by the customer in a supplier's offering (Zeithaml, 1988; Kotler & Keller, 2006). During the perceived value assessment, perceived benefits are a combination of physical attributes, service attributes and technical support available in relation to a particular use situation (Woodruff, 1997); whereas perceived sacrifices include both monetary and non-monetary sacrifices such as time consumption, energy consumption and stress experienced by customers (Yang & Peterson, 2004). The result of perceived value is a cognitive comparison process which captures any benefit–sacrifice discrepancy in much the same way as disconfirmation does for variations between expectations and perceived performance (Patterson & Spreng, 1997). Therefore, perceived value is subjective to what consumers perceive as benefit, and sacrifice differs from person to person (Zeithaml, 1988). Research denotes that perceived value is an important antecedent to satisfaction resulting in behavioural intentions (Cronin Jr et al., 2000). Thus, perceived value can predict post-purchase behaviours measured by repurchase intentions and willingness to recommend to others (Kuo et al., 2009).

Perceived value can be analysed with a unidimensional approach which conceptualises customer value as what consumers gain for what they give (Petrick, 2004; Kim & Gupta, 2009). This approach utilises single-item measures or captures consumer value simply as a trade-off between price and quality (Lloyd et al., 2011). Nevertheless, the validity of the unidimensional measure has been doubted because this approach assumes that consumer value is solely conceived with a utilitarian perspective and thus ignores the complex nature of perceived value (Sweeney & Soutar, 2001; Chen & Dubinsky, 2003). Instead of unidimensional measure, studies commonly proposed that perceived value should be multidimensional in nature (Chen & Dubinsky, 2003; Callarisa Fiol et al., 2011; Prebensen & Rosengren, 2016), especially in the mobile commerce (Ozturk, Nusair,

et al., 2016). Chun et al. (2012) indicated that the advancements in mobile technologies have reinforced the level of functionality (i.e. ease of use, personalisation and responsiveness) of mobile devices, which has presumably extended the use from utilitarian purposes to hedonic enjoyment. Hence, the multidimensional approach consisting of utilitarian and hedonic values appears to be appropriate dimensions of perceived value. Correlatively, prior research indicated that the combination of utilitarian and hedonic values are important in mobile shopping services (Chiu et al., 2014), especially, given that consumers value product information (utilitarian) and entertainment (hedonic) when using mobile devices (Yang, 2010; Bilgihan & Bujisic, 2015; Ozturk, Bilgihan, et al., 2016).

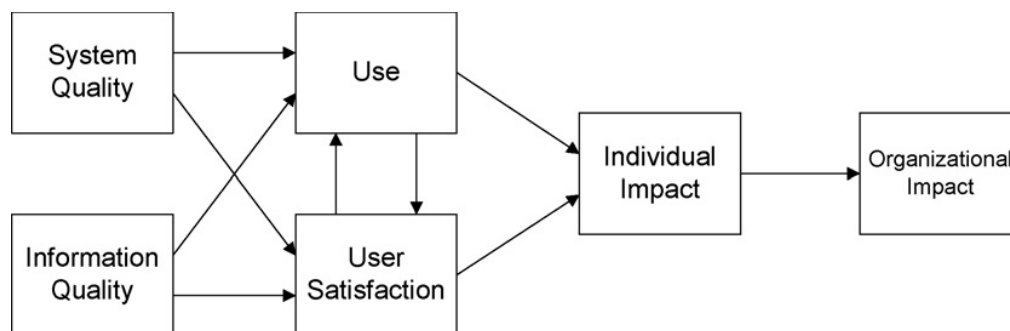
In addition, Mohd-Any et al. (2015) developed six dimensions derived from utilitarian and hedonic values to evaluate travel website users' perceived experience value: 1) utilitarian, 2) perceived control and freedom, 3) user's cognitive effort, 4) value for money, 5) emotional value and 6) social value. Considering that three factors of utilitarian, perceived control and freedom and user's cognitive effort are involved in the overlapped conceptions of information and system qualities (detailed interpretation of both in sections 2.8.1 and 2.8.2), the current research revolves around the literature and specifies perceived value as influenced by effort, value for money, emotional value and social value which are positively associated with online consumer reuse and recommend behavioural intentions. To investigate this phenomenon further, investigating the measurement of information system success is necessary.

2.7 Measurement of information system success

With all the initial research objectives, this research applies the updated DeLone and McLean (2003) Information System Success Model which is the core model to measure website quality into the study. DeLone and McLean (D&M) fundamentally proposed a taxonomy and an interactive model for conceptualising and operationalising information system (IS) success, which is the original D&M IS Success Model (DeLone & McLean, 1992). The model contributes two insights to the understanding of IS success. Firstly, it offers a scheme for categorising the multitude of IS success measures that have been used in the literature. Secondly, it forms a model of temporal and causal interdependencies between the categories (Seddon, 1997). As specified by the D&M IS Success Model, two independent variables, namely, 'system quality' and 'information quality' collaboratively affect 'use' and 'user satisfaction', each of which has a subsequent effect on

‘individual impact’ and ‘organisational impact’ (DeLone & McLean, 1992). Figure 1 presents the D&M original IS Success Model and shows the first stage of transformation from system and information quality to service quality. Henceforward, over 300 articles in refereed journals have referred to the framework (Delone & McLean, 2003), and numerous studies have undertaken empirical investigations regarding the multidimensional relationships among the measures of IS success (Igarria & Tan, 1997; Rai et al., 2002; Petter & McLean, 2009; Hsu et al., 2014; Tam & Oliveira, 2017).

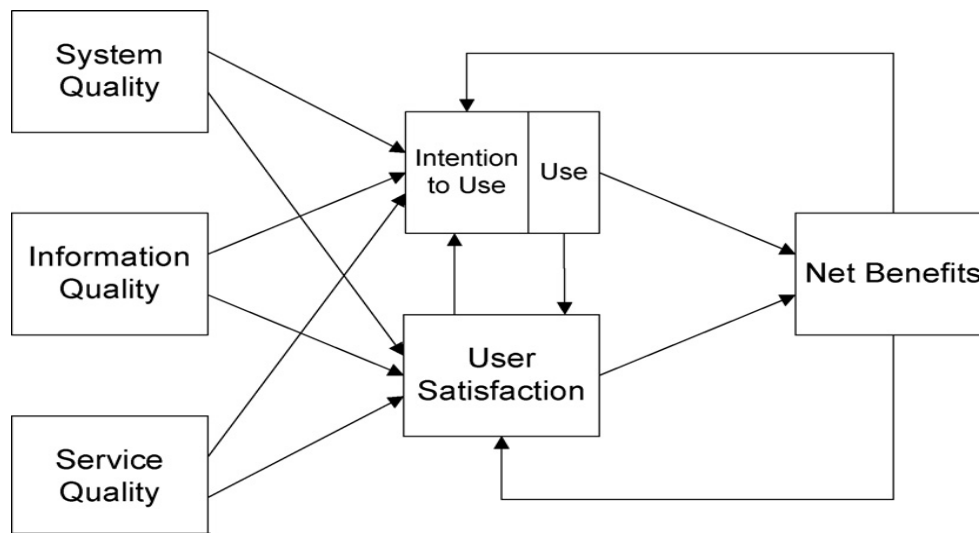
Figure 1: D&M original IS Success Model (1992)



Along with the popularity of original D&M IS Success Model and the changing IS environment, emerging modifications and limitations have impelled the updated model of D&M IS success (Delone & McLean, 2003). Seddon (1997) overcame the limitation of the original D&M IS Success Model by proposing an alternative model that focuses on the causal (variance) aspects of the interrelationships among the taxonomic categories; he subsequently separated the variance model of IS success from the variance model of behaviours that occur as a result of IS success. He further argues for the removal of ‘system’ and ‘use’ as a success variable in the causal Success Model, claiming that use is a behaviour and must precede impacts and benefits but does not cause them (Seddon, 1997; DeLone & McLean, 2002). Accordingly, D&M agree partially with Seddon’s premise that the combination of variance and process explanations of IS success in one model can be confusing and unduly complicates the Success Model. This idea is explained by the fact that the process model includes three causal components, namely, the creation, use and consequences of the system; each of these steps is necessary but an insufficient condition for the resultant outcome (Delone & McLean, 2003). Considering the changing nature of IS requires assessing service quality when evaluating IS success. Pitt et al. (1995) reasoned for the inclusion of ‘service

quality’ in the measurements to determine the efficiency of IS success. After reviewing theoretical and empirical inquiries of research and reflecting the changes and advents of IS practices, D&M proposed the updated D&M IS Success Model and evaluated its usefulness in light of the dramatic changes in IS practice, especially the advent and explosive growth of e-commerce (Delone & McLean, 2003). In the updated model, D&M added a new dimension of ‘service quality’ and grouped all the ‘impact’ measures into a single impact or benefit category called ‘net benefit’ (Delone & McLean, 2003). Figure 2 presents the updated D&M IS Success Model.

Figure 2: Updated D&M IS Success Model (2003)



The updated D&M IS Success Model has been highly cited and applied in the IT and IS fields as the theoretical basis to measure IS success (Tate et al., 2014). Numerous researchers demonstrated that the updated D&M IS Success Model combined with other models such as the Unified Theory of Acceptance and Usage of Technology and individual measures can explain repurchase intention in online services (Hsu et al., 2014) or the continuance intention of mobile payment service (Zhou, 2013). With the respective nature of this study and the intense investigation of the model’s propositions in a broad spectrum of contexts, the current research adopts the updated D&M IS Success Model as the conceptual basis for mobile website quality examination. To better fit the research focus on mobile setting, modification is conducted to adhere to the three key dimensions of the model: information quality, system quality and service quality.

2.7.1 Information quality

Owing to the characteristics of virtual environment in e-commerce, consumers depend strongly on website information (Szymanski & Hise, 2000). Information quality is thus a marketing tool that guarantees the smooth execution of transactions (Xu & Koronios, 2005) and a major factor in website success (Liu & Arnett, 2000). Information quality captures the e-commerce content issue, and web content should be personalised, complete, relevant and easy to understand and secure if we expect prospective buyers to initiate transactions via the Internet and return to our site on a regular basis (Delone and McLean (2003). Explicitly, user information satisfaction (UIS) is a useful measurement for information quality (Bai et al. (2008). UIS is defined as the extent to which users believe that the information system can meet their information requirements (Ives et al., 1983). This concept measures how users view their information system rather than the technical quality. Previous studies focusing on consumer perspectives have adopted different information quality measurements for IS success, including user satisfaction (Lin, 2007; Hsu et al., 2012), perceived benefits (Liu & Arnett, 2000; Zheng et al., 2013), accuracy (Liu & Arnett, 2000; Nilashi et al., 2016), accessibility (Yang et al., 2005; Xu et al., 2013), relevancy and timeliness (Sussman & Siegal, 2003; Bhattacharjee & Sanford, 2006; Cheung, 2014). In line with the literature, this research defines perceived information quality to consumer's overall judgment and evaluation of the quality of information. The latter is assessed by the degree of accuracy, informativeness, timeliness and relevancy of information provided by the website (Kim & Niehm, 2009).

2.7.2 System quality

System quality is a web-based IS that measures the functionality of an e-commerce system (Delone & McLean, 2003). A high level of system quality ensures the easy location of information, excludes irrelevant information (Jones et al., 2004; Zheng et al., 2013) and enables consumer interaction with sellers (Ma & Agarwal, 2007). Depending on the intended operational characteristics, system quality measurement is a multidimensional process focusing on different aspects. System quality is concerned with whether bugs exist in the system, the consistency of user interface, ease of use, quality of documentation and occasionally, the quality and maintainability of programme code (Seddon (1997). System reliability is the ease of use, convenience of access and response time; whilst system flexibility concerns system quality characteristics (Nelson et al. (2005) Delone and McLean (2003). In traditional studies, typical factors include response time,

ease of use, flexibility and stability (Wu & Wang, 2006). Researchers also identified interactivity, system features, usability, navigation, access, hyperlinks, website innovativeness, enjoyment and entertainment as related factors of system quality (Lin & Hsieh, 2011; O’Cass & Carlson, 2012; Urbach & Müller, 2012; Deb & Agrawal, 2017). Among all different factors, ease of use has been regarded as the most frequently used factor (Mohammad Salameh et al., 2018); it refers to the degree to which the user expects the use of the system to be user-friendly (Teo, 2001). In mobile commerce, ease of use is achieved when the system is used to fulfil customer needs and support services (Uther, 2002; Costabile et al., 2005). System quality is relative to the site success in terms of information retrieval and delivery (McKinney et al. (2002). Hence, this research construes that system quality refers to how easy and accurately consumers use the mobile website system to retrieve and deliver the information needed.

2.7.3 Service quality

In the context of e-commerce, service quality (e-SQ) is interpreted as the extent to which a website facilitates efficient and effective purchase and delivery of products and services (Zeithaml et al., 2002). Customers who have experienced a high level of service may repeatedly visit that website and eventually enhance the company’s financial success (Kim & Lee, 2002; Fang & Holsapple, 2007). Owing to the virtual characteristics of e-commerce, the way customers perceive the service quality of web-based settings is different from the traditional services assessed by the SERVQUAL model with five dimensions of tangibles, reliability, responsiveness, assurance and empath. In addition, e-satisfaction refers to the satisfaction of customers with respect to their online purchasing experiences as an instrument to measure e-SQ (Anderson & Srinivasan, 2003). E-SQ is tested to have a strong positive effect on customer satisfaction which leads to customer repurchase intention (Chang et al., 2009; Chau & Kao, 2009; Shin et al., 2013). For e-SQ evaluation, some researchers dwell upon web design and hardware performance, such as the SITEQUAL scale with four dimensions: ease of use, aesthetic design, processing speed and security (Yoo & Donthu, 2001); e-service quality measurement consists of five dimensions: information availability, ease of use, privacy, security, graphic style and reliability (Zeithaml et al., 2002). Apart from technical focus, other researchers concentrate on consumers’ perceptions of their online website experience; the perceived e-SQ factors include functionality, informativeness, security, presentation, responsiveness and customer relationships (Ho & Lee, 2007; Tsang et al.,

2010). Regardless of the specific focus the researcher is using, Parasuraman et al. (2005) addressed that e-SQ issues should be measured along the entire online shopping process, from information searching to online ordering, delivery, payment and after-sales service. Consequently, the holistic approach of both technical and perceptual dimensions of consumer's perceived e-SQ is necessary (Calabrese & Scoglio, 2012). Aligning with the literature, e-SQ in this research is delimited as the customer overall satisfaction from both technical and perceptual aspects and its interaction between customers and the mobile tourism website during usage.

2.8 Conceptualisation of mobile website quality construct

Fundamental to the updated D&M IS Success Model, the research initially proposes the modified model for mobile website quality examination. In 2003, D&M published the article about the ten-year update of the model of IS Success; they elucidated that to measure the success of a single system, 'information quality' or 'system quality' may be the most important components when measuring the overall success of the IS department as opposed to individual systems; 'service quality' may become the most important variable (Delone & McLean, 2003). Given that the research examines the overall success of different mobile tourism websites from either direct suppliers or intermediaries rather than one single system used earlier by travellers, the research argues that service quality, as the overall IS success assessment, is influenced by both information and system qualities. In addition, such argument is validated by extant research that website quality is a multidimensional construct comprising information, system and service qualities (Kim & Stoel, 2004; Ahn et al., 2007); whereas service quality is the overall customer evaluation and judgement of the quality perceived from the online consumption experience (Hsu et al., 2018). On the bases of these findings, the current research propounds that information and system qualities are affecting service quality, thereby depicting the overall perception of mobile website quality. Driven by this idea, the former part of the conceptual model regarding the examination of mobile website quality is developed (Figure 3), and the following two hypotheses are proposed as below:

H1: Information quality of mobile travel websites is positively related to its mobile website service quality.

H2: System quality of mobile travel websites is positively related to its mobile website service quality.

2.9 Correlation of service quality and perceived value

Bagozzi's model (1992) suggests a cognition–affect causal relationship; perceived e-SQ and perceived value can be seen as cognitive constructs that act as the determinants of affective response (Tam, 2012). When consumers' perceived service quality is high, they will experience a strong sensation of the benefits generating from a particular transaction. It then results to a rise in perceived value. Furthermore, the increased perceived value can lead to an intrinsic, positive emotional evaluation of the transaction, which is positively related to customer satisfaction (Lin & Wang, 2015). Hence, a number of studies reveal a positive relationship between perceived value and customer satisfaction across various service contexts, including in hospitality and tourism industries (Deng et al., 2013; Bajs, 2015; Joung et al., 2016). Several researchers suggested that perceived value is a better predictor than satisfaction given that these studies proposed and examined a more collective model, in which all three service evaluation variables (i.e. quality, value and satisfaction) directly contemporaneously lead to behavioural intentions (Cronin Jr et al., 2000; Oh, 2000). The empirical evidence of e-commerce studies has supported the proposition that perceived e-service quality has a positive influence on a customer's perceived value (Hsin & Wang, 2011; Lien et al., 2011; Deng et al., 2013; Joung et al., 2016; Lu & Wu, 2018). On the basis of the preceding empirical evidence, the third hypothesis is formulated:

H3: Mobile tourism website's service quality is positively related to perceived value of using it for travel product transactions.

2.10 Interrelationships among service quality, perceived value and behavioural intention

The research establishes the antecedent and mediating relationships among mobile website quality, perceived value and post-purchase behavioural intentions of reuse and recommend. As discussed above, the theoretical justification for the linkages between quality and value is derived from Bagozzi's framework which suggests that cognitive evaluations precede emotional responses; thus, the relationship should be starting from the initial service evaluation to an emotional reaction that in turn drives behaviour (Bagozzi, 1992; Tam, 2012). Correlatively in the field of e-commerce, Lee and Lin (2005) found that the evaluation of service quality of online shops positively influences post-purchase intention, and a significant link exists among website service quality, intention to reuse (Loiacono et al., 2002) and recommend (Filiari et al., 2015). During the

psychological process, perceived value is found to have a mediating effect in the relationship between website service quality and post-purchase consumer behaviour, such as loyalty intention, WOM (Tam, 2004; Yang & Peterson, 2004; Chen, 2008; Kuo et al., 2009) and repurchase intention (Byon et al., 2013; Hsu et al., 2015). With the extension of the above conceptualisations, the research proposes the following hypotheses:

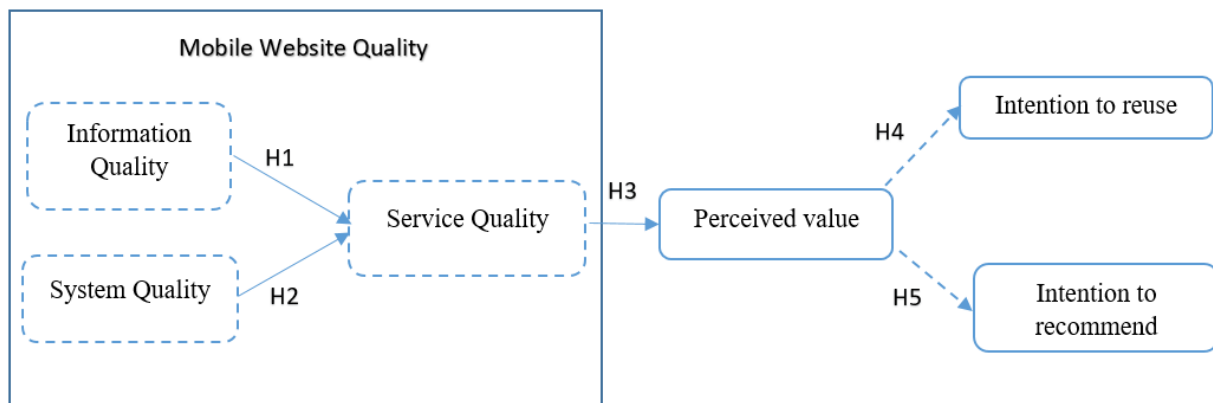
H4: Mobile tourism website’s service quality has an indirect impact on consumer’s intention to reuse with it mediated by perceived value.

H5: Mobile tourism website’s service quality has an indirect impact on consumer’s intention to recommend with it mediated by perceived value.

2.11 Proposed conceptual framework

Figure 3 displays the proposed conceptual framework concisely depicting the proposed hypotheses. Accordingly, five hypotheses (H1-H5) establish the associations among mobile tourism website quality derived from information, system and service qualities to perceived value, from perceived value to post-purchase behavioural intention to reuse and recommend. In the research, independent variables of mobile website quality are the information and system qualities, whilst the dependent variables are travellers’ intention to reuse and recommend mediated by perceived value.

Figure 3: Conceptual Framework



2.12 Chapter summary

This chapter reviewed the previous literature relevant to the study. Following a comprehensive review of the mobile tourism literature, two research gaps were identified, including the insufficient study for mobile website quality and the relatively fewer attention on post purchase intention in the field of mobile tourism. After explicating the paradigm of website quality from the updated D&M IS Success Model, the conceptual framework for mobile website quality was developed. The hypotheses acting as the tentative statements about the relationship among variables including information quality, system quality, service quality, perceived value, intention to reuse and recommend were explained. The procedures and data analysis techniques used to interpret the relationships will be discussed in the next chapter of methodology.

Chapter 3: Methodology

This chapter explicates the research procedures used to achieve the research goals. In order to examine the hypotheses formulated in Chapter 2, this study has developed the formative model to investigate the relationship of mobile tourism website to post-purchase intention to reuse and recommend. This chapter starts with a discussion of positivist sampling design, data collection procedures, questionnaire development, and scales utilization, followed by a series of data analysis procedures including the introduction of partial least squares structural equation modelling, justification of applying formative measurement, the exclusive nature of formative measurement and its validation.

3.1 Rationale and objectives of the study

Following the paradigm of mobile website quality-perceived value-intentions to reuse and recommend, the research adopted a mixed research method which included a procedure for collecting, analysing and integrating both quantitative and qualitative data at different research stages (Creswell & Creswell, 2005). The rationale for using the mixed methods was grounded in the fact that neither quantitative nor qualitative methods are sufficient because of the research objectives and the considerations of research qualities of reliability and validity. For the first research objective (RO1) which is to identify factors that contribute to customers' perception of mobile website service quality, qualitative research of literature reviews and mobile consumers' interviews could help broadly explore and identify the factors of mobile travel website service quality. This approach was crucial for content validity as the research must ensure that the elements within a measurement procedure are relevant and representative of the construct (Ivankova et al., 2006). Additionally, aligning with the second research objective (RO2), the research aims to predict results of consumer's intention to reuse and recommend by examining the underlying relationships among different variables. Therefore, quantitative research using statistical data analysis could support variable relationships and promote research reliability (Holton & Burnett, 2005). Hence, the mixed method was chosen as it grounded the research objectives and could promote research validity and reliability.

3.2 Research design

This section describes the research design of this study. The research design process took place in four main stages: 1) literature review for basic measurement development; 2) qualitative studies, including intensive interviews to modify measurements; 3) pre-test and pilot studies to validate the final measurement instrument and 4) quantitative research to test predetermined hypotheses. With the findings from the data analysis, interrelationships among the factors in the model are examined, and discussion of the results was provided.

3.2.1 Stage one: Basic measurement development

This section explains the first stage of the data collection process. The study adopted previously developed and validated scale items for measurement to form the basic measurement related to mobile website quality. The selection of the related literature for measurement development was based on the similar research objectives in tourism and hospitality studies and all of them were on quantitative basic, which was in the vein of this study. The following sections illustrate the measurement items used in the instrument and the internal consistencies among the measurement items. The wording of some items were also modified to match the study context.

3.2.1.1 Measurement of information quality

Table 6 presents the measurement items of information quality. Scale items for information quality shown in Table 3 were adapted from three sources of Wen (2012); Loiacono et al. (2007) and Zheng et al. (2013). Drawing upon the selected literature, information quality in this study aligns with D&M's definition (Delone & McLean, 2003), which refers to consumer's overall judgment (Zheng et al., 2013) and evaluation of the quality of information, assessed by the degree of accuracy, informativeness and customisation (Wen, 2012). Additionally, considering that tourism services are inherently intangible which cannot be judged physically before a trip, consumers rely heavily on the information in making the purchase decisions (Ponte et al., 2015). Therefore, specific items were considered for such information including fit-to-task and relevancy of information provided by the website (Loiacono et al., 2007). Moreover, user information satisfaction representing the overall perception from user's perspective is a useful measurement for information quality (Bai et al., 2008).

Table 6: Measurement of Information Quality

Dimension	Scale items	Source
Accuracy	IF1: The information provided by the travel website was accurate.	Wen (2012)
Customization	IF2: The travel website presented customized information.	
Informativeness	IF3: The travel website provided in-depth descriptions of its services.	
Informational Fit-to-Task	IF4: The information on the Web site is what I need to carry out my tasks.	Loiacono et al. (2007)
Effectiveness	IF5: The information on the Web site is effective to meet my needs.	
Relevancy	IF8: In general, the travel website provided me with information that is useful to me.	Zheng et al. (2013)

**IF6, 7 are developed from interviews, details provided in 3.3.2: Interview findings*

3.2.1.2 Measurement of system quality

This study utilised the measurement items of system quality developed by Hsu et al. (2012) and Wen (2012). According to their academic articles, four basic measurements are accessibility, response time, reliability and integration. Hsu et al. (2012) denoted these items as unique dimensions that act as antecedents to system quality distinct from either ease of use or service factors. Given that system quality reflects the information processing system required to produce that output, the dimensions of system quality therefore represent user perceptions of interaction with the system over time. In order words, system quality is more from the technical aspect, implying that it manifests in a website system's overall performance (Hsu et al., 2012). Considering that this study examines consumers who had experience of purchasing tourism service via mobile websites, dimensions of adaptability and usability focusing on reservation system should be included when processing payment (Wen, 2012). Table 7 presents the measurement items of system quality. In this sense, the study developed the measurement items of four basic items and combined it with the overall measure of system quality. Table 7 presents the five items used.

Table 7: Measurement of system quality

Dimension	Scale items	Source
Accessibility	SY1: The travel agency's website made information easy to access.	Hsu et al. (2012)
Respond time	SY2: The travel agency's website enabled me to get on to it quickly.	
Reliability	SY3: The travel agency's website performed reliably with no downtime during my usage.	
Integration	SY4: The travel agency's website effectively integrated data from different areas.	
Adaptability	SY5: The travel website has the characteristics to correct easily t. Technical problems related to booking of travel products.	Wen (2012)
Usability	SY6: I have an access to check the status of my transaction.	
Overall	SY7: In terms of system quality, I would rate the travel agency's website highly.	Hsu et al. (2012)

3.2.1.3 Measurement of service quality

Following the extant literature of e-SQ, the study defines service quality as the customer's overall satisfaction from both technical and perceptual aspects of e-service process and its interaction between customers and the mobile tourism website during service usage. With the comprehensive nature of service quality, the study adopted five measurement items of Jeon and Jeong (2017) and Hsu et al. (2012), comprising customer experience, reputation and customer service. In addition, to align the service quality with its overall attribute, a question emerged regarding the overall perception of service quality (Hsu et al., 2012). Table 8 presents the measurement items of service quality.

Table 8: Measurement of service quality

Dimension	Scale items	Source
Customer experience	SV1: The website provided the exact service quality I expected or desired.	Jeon and Jeong (2017)
Reputation	SV2: The website's service offerings matched its rating	
Communication	SV3: I could speak with a representative at the travel website in case I have problems with my account.	Hsu et al. (2012)
Customer awareness	SV4: The travel agency's website understands the needs of their customers.	
Overall	SV5: Overall, the tourism website was good in its service quality.	

3.2.1.4 Measurement of perceived value

The trade-off between what customers receive and what they give is premised on the concept of perceived value (Zeithaml, 1988; Prebensen & Rosengren, 2016). The current study is in line with the core concept defining perceived value as the evaluation of the benefits of a product or a service by customers based on their advanced sacrifices and ex-post perceived performance when they use mobile tourism website. Hence, perceived value includes price and time values consisting of six items that were included as measurements (Wu & Law, 2019). Specifically, to comprehend what exactly the perceived value consumers perceived during their experiences of mobile tourism consumption, this study intentionally asked the questions related to utilitarian and hedonic values. This intention is based on the previous research, which has indicated that when consumers perceive high levels of utilitarian and hedonic values from consumption experiences, they tend to express positive behavioural intentions, such as repeat purchase and continued use (Chang, 2013; Chiu et al., 2014; Escobar-Rodríguez & Carvajal-Trujillo, 2014; Kandampully et al., 2015; Prebensen & Rosengren, 2016). Mohd-Any et al. (2015) developed six factors derived from utilitarian and hedonic values to evaluate travel website users' perceived experience value: 1) utilitarian, 2) perceived control and freedom, 3) user's cognitive effort, 4) value for money, 5) emotional value and 6) social value. Considering that three factors of utilitarian, perceived control and freedom and user's cognitive effort involve the overlapping conceptions of information and system qualities (detailed interpretation of both in sections 2.8.1 and 2.8.2), this research revolves around the literature and specifies perceived value as influenced by effort, value for money, emotional value and social value which are positively associated with online buyers' repeat purchase intentions and recommendation. To measure perceived value and its in-depth perspective, two modified measurement items were adapted from Mohd-Any et al. (2015). Table 9 displays the measurement items of perceived value.

Table 9: Measurement of perceived value

Dimension	Scale items	Source
Price value	PV1: Price charges in the mobile website are acceptable.	Wu and Law (2019)
	PV2: The booking through the mobile website is considered to be a good buy.	
	PV3: The product in the mobile website is good value for money.	
Time value	PV4: The time spent in making this purchase from the mobile website is less than other ways.	Mohd-Any et al. (2015)
	PV5 Booking hotel rooms from the mobile website is a time-saving transaction.	
	PV6: Booking hotel rooms from the mobile website is the right choice if saving time is considered.	
Emotional value	PV7: This [service experience] makes me happy.	
Social value	PV8: Participating in this [service experience] makes me feel more socially accepted.	

3.2.1.5 Measurement of behavioural intention

Two dimensions of behavioural intentions were measured in this study including behavioural intention to reuse and recommend. The study sustains the argument of Ajzen (2002) that the prediction of behavioural intentions based on the consumer’s attitude or intention is more precise than action, as customers may purchase under constraints instead of actual preferences. Hence, this study focuses on the participant’s intention to reuse and recommend previous purchased mobile tourism website. Measurement items were adapted from Rita et al. (2018) and Ha and Im (2012). Furthermore, the nitty-gritty details of reusing and recommending the purchased website is not the same as reusing and recommending the websites from the same company. As an example, consumer-consumed accommodation with the mobile website of Grand Hyatt Hong Kong and numerous mobile websites of Hyatt Hotels Corporation may be used in the future. For the sake of revealing this likelihood, two modified questions based on the selected literature were asked accordingly. Table 10 shows the measurement items of intention to reuse and recommend.

Table 10: Measurement of behavioural intention

Dimension	Scale items	Source
Behavioural intention to reuse	IT1: I predict I would use mobile hospitality services in the future.	Rita et al. (2018)
	IT2: I intend to use mobile hospitality services in the future.	
	IT3: Because of this experience, I am willing to visit the other website from this company to search for travel information in the future.	
Behavioural intention to recommend	IT4: I would recommend this website to other people.	Ha and Im (2012)
	IT5: I predict I would recommend the other website from this company to other people.	

3.2.2 Stage two: Qualitative interviews

This section describes the second stage of the data collection process and consists of the following: 1) an explanation of the sample selected for the qualitative interviews; 2) a description of the interview process and 3) the presentation of the interview findings. Considering that the previous literature might exclude sufficient measurements of mobile website quality and the most relevant instruments of perceived value, the qualitative interviews with mobile consumers were conducted to provide a rigorous understanding of mobile website quality (Bogner et al., 2009). The semi-structured and open-ended interviews were conducted with the intention to facilitate a level of flexibility that allowed participants to shape the direction of the interview whilst remaining on-topic (Newcomer et al., 2015).

3.2.2.1 Sample of the interviews

Purposeful sampling was employed to optimise the quality of the data collected (Palinkas et al., 2015). This study selected participants on the basis of the following criteria: 1) participants who have been travelling at least twice in the last three years and 2) participants who have previously conducted transactions with different types of mobile tourism websites, i.e., direct suppliers and intermediaries. These criteria were necessary to ensure that the participants included in the sample will successfully provide rich information in accordance with the length and depth of their experiences with the phenomenon under investigation (Suri, 2011), specifically providing rich information on the use of different types of mobile websites.

3.2.2.2 Interview process

In-depth interviews were conducted face-to-face and by telephone. The interviews were conducted over a period of eighteen months. A total of 11 in-depth interviews (business travellers $n = 4$, leisure/holiday independent travellers $n = 7$) were conducted until answers became repetitive in each dimension to generate primary data for quality to the point of theoretical saturation (Robinson, 2014). The concept of theoretical saturation refers to repetition and redundancy in the data and that is reached when “properties and dimensions of the concepts and conceptual relationships selected to render the target event are fully described (Low, 2019). The average interview time was approximately 25 min. Participants who met the previously mentioned criteria were invited via personal contact and work email. Prior to the interview, statement of intention was verbally explained to each interviewee. This protocol ensured that participants understand the research process and their role in the data collection process. Authorisation of recording the interviews was formally requested. Each interview consisted of an open conversational component to facilitate both the participants’ story-telling about their experience in using mobile tourism websites.

The questions in the interview included four categories: 1) information quality, 2) system quality, 3) service quality and 4) perceived value. During the interview, participants were firstly asked to identify and justify the type of mobile tourism website used. Secondly, participants were asked to offer their opinions of each category after the latter was explained to them. Depending on the awareness and the depth of answers, the measurement options developed from the literature review were given to participants who remained unsure about that category after the definition was provided. Then, participants could base on each measurement to express their views, such as the level of agreement or disagreement and accompanying reasons for their answers. In other words, if participants still have no idea what information quality means after its definition was given, indicator questions of each construct from previous literature are provided. For example, for accuracy as one of the indicators of information quality, the following questions are raised to stimulate participant’s better ideas: ‘Do you think that website provided accurate information?’ and ‘How do you define accurate information?’ Finally, participants offered their opinions on the perceived value in relation to the mobile tourism website. Ultimately, the interview content was expected to draw attention to patterned regularities or phrases, expectations and perceptions that appear with greater frequency than other information to contribute to the findings.

3.2.2.3 Interview findings

The qualitative data were content analysed. Coding was used to interpret the interview findings of 11 participants. Coding was based on content and word count analysis, including keywords from each category assisting in organising the data and detecting patterns, themes and commonalities (Campbell et al., 2013). Analysis of various comments was intended to highlight descriptive information on the basis of the narrative data collected and subsequently lead to forming summaries. For mobile website quality, the interview findings show that most of the instruments of information, system and service qualities developed from the literature review are covered. Two new instruments under the category of information quality were discovered, including the different choices and clear photos provided by mobile tourism websites. Some of the interviewees agreed that they value different choices that can support them in the purchase decision-making process. In addition, participants seemed to value clear photos in a mobile tourism website as the photos provide them with other cues regarding the tourism services. In relation to perceived value, (i.e. value of time effort spent, value for money, emotional and social value), the majority of interviewees indicated time, economic and emotional value dimensions as relevant to their experience. Interestingly, only one of the interviewees perceived social value as important. Hence, this study incorporates the interview findings and adds two additional questions to the existing questionnaire. That is, IF6: The mobile tourism website provided me different choices for my decision making and IF7: The mobile tourism website presented clear photos that helped me understand the tourism product/service. The online questionnaire formed after this stage is attached in Appendix 1.

3.2.3 Stage three: Pre-test and pilot test

This section explains the third stage of the data collection process that included the pre-test and pilot test. Both pre-test and pilot test were performed to validate the instrument before conducting the survey. Data from the pilot test were examined to check the reliability and validity of the measurements. Two procedures of pre-test and pilot test were involved progressively.

3.2.3.1 Pre-test

The pre-test of the English questionnaire comprises 32 items was firstly translated by a native Chinese editor. In order to ensure the Chinese questionnaire had no confusion for understanding,

eight Chinese native-speaking academic researchers and students from the School of Hotel & Tourism Management at Hong Kong Polytechnic University were invited to participate in this pre-test. The pre-test aimed to improve the content and the overall appearance of the instrument. It further ensured the clarity of the measurements and refinement of items following the feedback of participants (Anderson & Gerbing, 1991). The adjusted research measurements were tested along with the outcomes of the qualitative interviews. This procedure ensured that the researcher detects all misunderstandings, ambiguities and other difficulties participants might encounter in the instrument items (Perneger et al., 2015). The research was conducted in China, thereby highlighting the necessity to allow for the professional translation of the research instrument from English to Chinese. The feedback from the pre-test was incorporated in the final measuring instrument (see Appendix 2).

3.2.3.2 Pilot test

The pilot study was conducted by a research company, namely, Wenjuanxing, and consisted of a survey of 200 questionnaires. The pilot study aimed to ensure a high level of data quality. The decision to include such a high number of participants in the pilot study was based on a study conducted by Perneger et al. (2015). This study indicates that 90% of the data quality are likely when more participants are included in the sample (Perneger et al. (2015). The result of the pilot test confirms the reliability of the measuring instrument, and no modifications were needed.

3.2.4 Stage four: Quantitative survey

This section explains the fourth stage of the data collection process. It provides an overview of the quantitative survey conducted in this study, followed by a description of the sample and the quantitative data collection procedures. This study conducted a quantitative survey to collect primary data. The quantitative approach was grounded on the fundamental research aims of determining the likelihood of mobile website quality affecting consumer behavioural intentions to reuse and recommend.

3.2.4.1 Population and sample

The population of this study consisted of mobile tourism website consumers in China aged 18 years and older. Chinese participants were selected because of the well-developed online tourism

market in this country. The online travel market in China totalled US\$87.46 billion in 2016 (China Internet Watch, 2017), and this figure is estimated to rise from 17% of the world to 24% by 2020 (eMarketer, 2017). Owing to the active and mature Chinese online travel market, data from China are expected to reflect the result of this study better and eventually ensure research implications for mobile tourism. The chronological order of this study's data collection process was rigorously followed: stages 1 and 2 included a qualitative approach, and stages 2 and 3 included a quantitative approach built on the new outcomes of stages 1 and 2. The chronological order of this research process was needed to ensure data quality and to demonstrate a high degree of originality and contribution in academic literature.

3.2.4.2 Sample and Data collection

The study was conducted online via the popular Chinese professional survey company called Wenjuanxing (www.sojump.com, a website analogous to SurveyMonkey). Wenjuanxing comprises over 2.6 million members from all regions of China and is engaged in various occupations and equal gender distribution (Zheng & Zheng, 2015). The questionnaire used in this survey was refined on the basis of the results of stages 2 and 3. An online survey method was chosen due to its advantages in saving time, easy access to unique populations and relatively inexpensive cost than traditional paper and pencil surveys (Wright, 2005).

For this study, participants had to use either OTA or direct supplier for purchasing travel service in the past 12 months. Wenjuanxing sent out a website link with a brief introduction of the survey, and participants interested in the survey could complete the survey via the website or social media (WeChat). To verify whether participants were relevant and paying attention to the study, they were required to specify which mobile websites they used before and answered the attention check question. The higher data collection plan of industrial version was consumed to ensure two key data quality characteristics, accuracy and incompleteness (Parssian et al., 1999). Before confirming all data received, Wenjuanxing went through the following six quality data verification procedures: 1) accuracy of the mobile website name as specified by participants, 2) participants refill limitation, 3) filling time control (valid questionnaire with no less than 4-min time for completion), 4) automatic filter for not passing the attention check question, 5) no straight-line responses and 6) completeness control for no missing data and questions. Finally, all 330 samples collected equally

for OTAs and direct suppliers passed the above data quality verification and thus qualified for the study.

The sample of this study was recruited from Wenjuanxing members. Adult members of Wenjuanxing received an e-mail with a brief introduction of the study and the survey attached to the website. Participants interested to participate in the survey completed the survey on the website. The questionnaires were distributed until the target sample size for each population was saturated. According to the requirements for running a factor analysis, the required ratio of measurements to observations is one measurement to at least five observations (Hair et al., 2010). Thus, the appropriate sample size for this study's pilot test was 320 measurements for a total of 32 items. The study then targeted 165 sample cases for each of the two samples (direct suppliers and intermediates), all together 330 sample minimum for the data collection.

3.3 Data analysis

Data analysis was performed using both Statistical Programme for Social Sciences version 25.0 (SPSS 25) and SmartPLS (v. 3.2.9). The maximum likelihood estimate for the covariance matrix was assessed. Data analysis consisted of four phases: (1) data screening, (2) descriptive statistics, (3) confirmatory factor analysis and (4) structural equation modelling approach. The following sections 3.6.1 to 3.6.4 elucidate the data analysis procedures, accordingly.

3.3.1 Data screening

Prior to the analysis of the conceptual model, variables were examined for accuracy of data distribution. The data screening procedure included the following: the checking of missing values, uni or multivariate outliers; the skewness of responses and the multicollinearity among variables (DeSimone et al., 2015). SPSS 25.0 was employed to identify the patterns and mechanism of missing data and to check the normality at both univariate and multivariate levels.

3.3.2 Descriptive analysis

Descriptive statistics, including percentages, means, standard deviations and frequencies were performed using SPSS 25.0. This process was conducted to describe measured variables, respondents' demographic information and individual characteristics. Both the measures of central

tendency (e.g. means) and the measures of dispersion (e.g. standard deviation) were provided in this study to describe the basic properties of the data.

3.3.3 Formative measurement model data analysis

This research suggested a theory based alternative, formative measurement model using SmartPLS (v. 3.2.9) for analysis (C. M. Ringle et al., 2015). Since the introduction by Chin (1998), formative measurement in information system literature has been adopted due to its nature and purpose (Cenfetelli & Bassellier, 2009). In formative measurement, changes in formative indicators are suggested to cause changes in their corresponding latent construct (Nunnally & Bernstein, 1994). Distinctively formative indicators need not covary and can be mutually exclusive, which is different from the reflective measurement. Adopting formative approach in this study was justified in that all proposed indicators could potentially cause the latent constructs event if they are not necessarily correlated. For example, for mobile website quality, two information quality indicators of in-depth descriptions of its services (IF3) and different choices (IF6) provided were not necessarily correlated. Similarly, the perceived value indicators of price and time value can also not be associated. Participants were reasonable to think that the mobile website site helped them determine price value without them experiencing any time value. Correspondingly, for behavioural intentions to reuse and recommend, indicators that showed ‘will you reuse or recommend the used mobile website again’, were not positively interrelated to the reuse and recommendation of the other mobile websites of the company. According to the review of PLS in organisation management research, utilising formative measurements in the research model typically leads researchers to use PLS-SEM (Xu et al., 2019).

3.4 Partial least squares structural equation modelling

The composite-based partial least squares-SEM (PLS-SEM) was applied in this study due to its high statistical power, especially in relation to exploratory research (Usakli & Kucukergin, 2018). PLS-SEM focuses on the overall variances that include both common and unique variances to predict the variance explanation in the dependent variables (Xu et al., 2019). In PLS, the latent variables are composite scores of the corresponding indicator items with individual weight (Xu et al., 2019). Unlike the covariance-based structural equation modelling (CB-SEM) based on the precision of maximum likelihood estimation to achieve optimal predictions, PLS does not require

the assumption of multivariate normality (Hair et al., 2019). The construct scores of the latent variables in PLS are created by aggregating the indicator items that involve measurement errors; thus, PLS estimates of construct scores are biased and are only consistent under the conditions of ‘consistency at large’, which refer to a large number of items per construct, high communality and large sample sizes (Xu et al., 2019). With its high predictive power in testing a theoretical framework, it matches the primary aim of this study, which is to see how the proposed conceptual model of mobile website quality could predict the behavioural intentions of reuse and recommend. In addition, the adoption of PLS-SEM founded the basis for PLS multi-group analysis (PLS-MGA) in comparing two groups of OTAs and direct suppliers’ mobile websites. The PLS-MGA, also known as moderating effect to moderate the causal effect between exogenous and endogenous constructs, can identify variations among specified groups within the data set (Henseler, 2012) in consonance with the final research objective. The results of PLS-MGA were generated by SmartPLS (v. 3.2.9) (C. M. Ringle et al., 2015).

3.5 Validation of formative measurements

Considering the differences in the reflective and formative measurements, the procedures widely accepted to evaluate the reliability and validity of reflective constructs, including the Fornell-Larcker criterion (HTMT) revealing collinearity issue, average variance extracted (AVE), composite reliability (CR) and Cronbach's alpha are inappropriate for formative constructs (Hair et al., 2019; Xu et al., 2019). Given that formative indicators need not be highly correlated, internal consistency is not a useful validation criterion for formative indicators; instead, researchers should assess the assumption of the absence of multi-collinearity of formative indicators to evaluate the formative construct’s reliability (Diamantopoulos & Sigauw, 2006). To detect the validation of formative measurements, procedures include the variance inflation factor (VIF) for multicollinearity test (Xu et al., 2019), formative indicator’s weight (same as outer weight) and loading significance for indicator significance and relevance (Götz et al., 2010).

3.6 Chapter summary

This chapter discussed the methodology used in this study including the justification of adopting the mixed research methods, development and validation of the study’s measurements, sampling procedures and data collection. This chapter also provided the justification of applying the

formative measurement model and its exclusive natures and analytical methods. The following chapter provides an analysis of the results from the data collected.

Chapter 4: Data analysis and results

This chapter reports the data analysis and results from the formative study. First, the chapter provides the narration of sample and data collection, followed by the analyses of descriptive information and normality. Second, the evaluations for outer and inner models are presented, and, finally, the chapter concludes with the summary of multi-group analysis and hypothesis testing.

4.1 Descriptive analysis

Descriptive analysis was executed using the SPSS version 25 to check the general distribution of the data and the respondents' demographic characteristics. Table 11 presents an analysis of the demographic data of two types of mobile bookers.

For OTA mobile consumers, respondents were roughly evenly distributed in terms of gender, with 43.6% male to 56.4% female. The majority which account for 49.1% of the respondents were 25 to 34 years old. Most of the respondents indicated they had earned the following higher education degree: college at 13.9%, university bachelor's degree at 75.2% and master's degree at 6.1%. For their monthly salary, 35.2% of the participants earned RMB¥ 6,000 or below, 22.4% earned RMB¥ 6,000–7,000, 14.5% earned RMB¥ 8,000–9,000 and 27.8% earned RMB¥ 10,000 or above. The most common travel purposes for using mobile OTAs for reservations were recreation and vacation at 83%, and the rest of them included business at 4.8%; visiting family, relatives or friends at 6.1% and conference meetings at 4.8%.

For mobile consumers who used direct suppliers, most of the respondents were females at 63% and males at 37%. The average age of the respondents was around 25–26 years old; and the major respondents at 56.4% were 25 to 34 years old, followed by the age group of 18–24 at 21.2%. Most of the respondents indicated they had earned the following higher education degree: college degree at 12.1%, university bachelor's degree at 75.8% and master's degree at 7.9%. For their monthly salary, respondents earned below RMB¥ 6,000 or below, and RMB¥ 6,000–7,000 were the major portions with 22.4% and 23.6%, respectively. Altogether, 53.8% of the respondents earned RMB¥ 8,000 or above. The most frequent travel purposes for using mobile direct supplier's website for reservations were recreation and vacation at 67.9%, and the rest of them included

business at 13.9%; visiting family, relatives or friends at 6.7%, conference meetings at 10.9% and religion at 0.6%.

Table 11: Demographic Profile of the Respondents for Each Subsample

Demographic Characteristics	OTA Subsample (n=165)		Direct supplier Subsample (n=165)	
	n	%	n	%
Gender				
Male	72	43.6	61	37.0
Female	93	56.4	104	63.0
Age				
18-24	51	30.9	35	21.2
25-34	81	49.1	93	56.4
35-44	24	14.5	29	17.6
45-54	5	3.0	6	3.6
55-64	4	2.4	2	1.2
65 or above	0	0	0	0
Education				
Below High School Education	2	1.2	6	3.6
High School Education	5	3.0	20	12.1
College Degree	23	13.9	125	75.8
University Bachelor Degree	124	75.2	13	7.9
Master Degree	10	6.1	1	0.6
PhD/Doctoral Degree	0	0	6	3.6
Other	1	0.6	0	0
Monthly Income (RMB¥ per month)				
Less than 6,000	58	35.2	37	22.4
6000-7999	37	22.4	39	23.6
8000-9999	24	14.5	36	21.8
10,000-12,999	22	13.3	24	14.5
13,000-15,999	14	8.5	20	12.1
16,000-19,999	6	3.6	4	2.4
20,000 or above	4	2.4	5	3.0
Travel purpose				
Business	8	4.8	23	13.9
Visit family, relatives and / or friends	10	6.1	11	6.7
Recreation (e.g.: stress relief, leisure vacation, sightseeing and shopping, honeymoon)	137	83.0	112	67.9
Attend conferences, meetings, exhibitions, seminars or other forms of education	8	4.8	18	10.9
Religion	0	0	1	0.6
Medical health (for example: hospital medical examination, surgery)	0	0	0	0
Other	2	1.2	0	0

Note: n - frequency; % - percentage; Percentage may not add up to 100% due to rounding

4.2 Normality analysis

The mean value of each measurement item for each group ranged from 6.23 to 4.76 and 6.15 to 4.72, and the standard deviation ranged from 0.1480 to 0.749, 1.508 to 0.709 for OTAs and direct suppliers, respectively. The overall skewness was lower than ± 2.0 , generally indicating a normal distribution of data (George & Mallery, 2010). Additionally, the no kurtosis values were smaller than -2.0 and, the no kurtosis values were smaller than -2.0. Overall, data of each group were considered to be in an acceptable distribution range at the univariate level. Although the estimation of SEM-PLS does not require the assumption of normality (Chin, 1998), the above skewness and kurtosis results indicate that the data were not multivariate because the normality data are a basic supposition in multivariate analysis (Hair et al., 2011). Tables 12 and 13 separately display the normality test results of OTAs and direct suppliers data respectively.

Table 12: Means, Standard Deviations and Normality of Indicators for OTAs Subsample

Variables	Mean	S.D.	Skewness	Kurtosis
Information quality				
IF1 -Accuracy	5.67	0.774	-0.554	0.470
IF2 - Customization	6.17	0.881	-1.315	2.919
IF3 - Informativeness	6.06	0.874	-0.894	0.609
IF4 - Informational Fit-to-Task	5.90	0.970	-0.979	1.273
IF5 - Effectiveness	5.87	0.880	-0.550	0.231
IF6 – Different choices	5.71	1.012	-0.853	0.781
IF7- Clear photo	5.53	1.033	-0.241	-0.448
IF8 - Overall information performance	5.53	1.118	-0.493	-0.341
System quality				
SY1 - Accessibility	5.64	0.981	-0.366	-0.361
SY2 - Respond time	6.07	0.991	-0.794	-0.295
SY3 - Reliability	5.95	1.035	-0.938	0.700
SY4 - Integration	5.56	1.112	-0.538	-0.245
SY5 - Adaptability	4.90	1.289	-0.250	-0.697
SY6 - Usability	6.11	0.749	-0.181	-1.192
SY7 – Overall system performance	5.98	0.927	-0.661	-0.362
Service quality				
SV1- Customer experience	5.58	1.001	-0.802	0.688

SV2 - Reputable service	5.26	1.184	-0.944	1.399
SV3 - Communication	5.63	1.284	-1.150	1.132
SV4- Customer awareness	5.42	1.260	-1.049	0.902
SV5- Overall service performance	5.93	0.793	-0.612	0.629
Perceived value				
PV1- Price value	5.70	0.989	-0.521	-0.256
PV2- Price value	5.58	1.060	-0.498	0.006
PV3- Price value	5.36	1.099	-0.679	0.567
PV4- Time value	5.35	1.229	-0.700	0.456
PV5- Time value	5.66	1.217	-0.781	0.223
PV6- Time value	5.73	1.138	-1.044	1.471
PV7 - Emotional value	5.65	1.074	-0.916	1.372
Behavioural intention				
IT1- Reuse	6.23	0.831	-1.294	3.209
IT2- Reuse	6.16	0.930	-1.332	2.573
IT3 – Use other website	4.76	1.352	-0.535	0.294
IT4 – Recommend	5.50	1.074	-0.769	0.566
IT5 – Recommend other website	4.85	1.480	-0.421	-0.288

Table 13: Means, Standard Deviations and Normality of Indicators for Direct Suppliers Subsample

Variables	Mean	S.D.	Skewness	Kurtosis
Information quality				
IF1 -Accuracy	5.89	0.789	-1.464	4.753
IF2 - Customization	6.01	0.917	-0.696	-0.070
IF3 - Informativeness	5.95	0.840	-0.534	0.106
IF4 - Informational Fit-to-Task	5.94	0.961	-1.089	1.774
IF5 - Effectiveness	6.06	0.853	-0.653	-0.176
IF6 – Different choices	5.71	1.012	-0.888	1.389
IF7- Clear photo	5.64	1.137	-0.723	0.269
IF8 - Overall information performance	5.67	0.995	-0.620	0.226
System quality				
SY1 - Accessibility	5.79	0.934	-0.668	0.277

SY2 - Respond time	5.84	1.018	-0.943	1.323
SY3 - Reliability	5.82	1.059	-0.734	0.302
SY4 - Integration	5.79	1.073	-0.927	1.090
SY5 - Adaptability	5.38	1.285	-0.628	-0.266
SY6 - Usability	6.15	0.709	-0.216	-0.988
SY7 – Overall system performance	5.92	0.984	-0.800	0.204
Service quality				
SV1- Customer experience	5.60	1.058	-0.767	0.629
SV2 - Reputable service	5.55	1.015	-0.532	0.300
SV3 - Communication	5.70	1.073	-0.958	0.828
SV4- Customer awareness	5.71	1.000	-0.721	0.621
SV5- Overall service performance	5.96	0.818	-0.609	0.406
Perceived value				
PV1- Price value	5.81	0.860	-0.502	0.030
PV2- Price value	5.52	0.979	-0.257	-0.472
PV3- Price value	5.56	1.044	-0.464	-0.054
PV4- Time value	5.47	1.197	-0.730	0.154
PV5- Time value	5.72	1.028	-0.544	-0.278
PV6- Time value	5.87	0.921	-0.917	1.424
PV7 - Emotional value	5.82	0.994	-0.433	-0.534
Behavioural intention				
IT1- Reuse	6.05	0.861	-0.558	-0.439
IT2- Reuse	5.99	1.076	-1.520	2.859
IT3 – Use other website	4.90	1.346	-0.341	-0.290
IT4 – Recommend	5.45	1.062	-0.653	0.571
IT5 – Recommend other website	4.72	1.508	-0.680	-0.206

4.3 Outer model evaluation

Different from reflective model focusing on the internal consistency, formative model has its own standard procedures for measurement validation (Hair et al., 2019). Notably, PLS-SEM uses the sample data to obtain parameters that best predict the endogenous constructs as opposed to estimating parameters that minimise the difference between the observed sample covariance matrix and the covariance matrix estimated by the model (Hair Jr et al., 2014). Hence, the

traditional reflective indicator measures including the Fornell-Larcker criterion (HTMT) revealing collinearity issue, average variance extracted (AVE), composite reliability (CR) and Cronbach's alpha testing internal consistency are not a meaningful measure for formative indicators (Hair Jr et al., 2014). Following the formative measurement criteria provided by Hair et al. (2019), the outer model evaluations include convergent validity, indicator collinearity, statistical significance and relevance of the indicator weights.

4.3.1 Convergent validity

For formatively measured constructs, convergent validity is assessed by the correlation of the construct with an alternative measure of the same concept, and this procedure is referred to as redundancy analysis (Chin, 1998). Dissimilar to reflective constructs commonly using factor loading for checking convergent validity, redundancy analysis is processed in the research design stage to include alternative reflective measured indicators of the same concept in their questionnaire. This finding suggests that a single item, which captures the essence of the construct under consideration, is generally sufficient as an alternative measure (Cheah et al., 2018). Following rules of such condition, all items developed for each construct were found in the literature using reflective measured indicators with a high factor loading of > 0.7 , Average Variance Extracted (AVE) of each construct at > 0.50 (Fornell & Larcker, 1981) and Composite Reliability (CR) at > 0.70 (Fornell & Larcker, 1981). In addition, each of the mobile website quality construct has one global indicator, capturing the essence of constructs (IF8, SY7 and SV5) which fulfilled the process of convergent validity.

4.3.2 Indicator collinearity, weight, significance and relevance

The positive weights indicate the unique contribution of each indicator, controlling for the other indicators (Iden & Eikebrokk, 2014). Tables 14 and 15 present the statistical results of this part, showing the original and modified results in every case. Firstly, the variance inflation factor (VIF) is used to the formative indicators to access collinearity. Ideally, the VIF values should be lower than 3, indicating that multicollinearity is not a concern (Hair et al., 2019). Meanwhile, the threshold of VIF below 3 is also a benchmark without concern of common method bias (CMB), a phenomenon caused by the measurement method used in an SEM study (Kock, 2017). All 32

indicators under VIF shown below in Table 14 were lower than 3 which specifies no problem of multicollinearity. Secondly, given that PLS-SEM is a nonparametric method, bootstrapping was used to determine statistical significance to assess the indicator weights' statistical significance and relevance (Chin, 1998). Bootstrapping is a resampling technique that draws a large number of subsamples from the original data (with replacement) and then estimates models for each subsample. This process suggests that the researcher obtains a large number (typically 5,000) of model estimates, which can be used to compute a standard error of each model parameter. In line with the suggestion, bootstrapping was performed with 5,000 samples to estimate p-value. Results of Table 14 show that the majority of indicators were lower than $p < 0.1$, thereby meeting the significance level. Notably, for the formative model, if the indicator weight is insignificant, it is not necessarily interpreted as evidence of poor measurement model quality. Instead, the indicator's absolute contribution to the construct is considered (Cenfetelli & Bassellier, 2009) as defined by its outer loading similar to bivariate correlation. According to Hair et al. (2016), only the formative indicator with both a non-significant outer weight and low outer loading of 0.5 or below should be eliminated as formative measurement theory requires the indicators to fully capture the entire domain of a construct. Hence, only indicators of IF2 and SY2 (remarked with*) were removed due to their insignificant p-value of outer weights > 0.1 and low outer loadings < 0.5 . After the removal of two indications, Table 15 presents the modified formative outer model passing the previously mentioned rules. Finally, for the indicator's relevance, all the 30 confirmed indicators in Table 15 were within the standardised range between +1 to -1 which represent the normal result that indicators are positively related to constructs. Conforming with Hair's criteria for all the aforementioned criteria, the remaining indicators shown in Table 15 are satisfactory in terms of collinearity, outer weight, outer significance and relevance. The research does not include the result of common bias method. The reason is that the occurrence of a VIF greater than 3.3 is proposed as an indication of pathological collinearity, and also as an indication that a model may be contaminated by common method bias (Kock, 2015). In this result, given all VIFs resulting from a full collinearity test were lower than 3.3, the model can be considered free of common method bias.

Table 14; Original measurement model: VIF, Outer Weight and Loading Significance

Indicators	Outer VIF	Outer Weight	Outer Weight, P-value	Outer Loadings	Outer Loadings, P-value
Information quality					
IF1 -Accuracy	1.318	0.301	0.00	0.61	0.00
IF2* - Customization (Removed)	1.178	-0.127	0.12	0.20	0.01
IF3 - Informativeness	1.271	0.068	0.44	0.50	0.00
IF4 - Informational Fit-to-Task	1.331	0.167	0.04	0.58	0.00
IF5 - Effectiveness	1.325	0.177	0.03	0.60	0.00
IF6 – Different choices	1.255	0.199	0.03	0.55	0.00
IF7- Clear photo	1.352	0.366	0.00	0.74	0.00
IF8 - Overall information performance	1.392	0.311	0.00	0.72	0.00
System quality					
SY1 - Accessibility	1.204	0.22	0.01	0.50	0.00
SY2* - Respond time (Removed)	1.317	0.079	0.44	0.47	0.00
SY3 - Reliability	1.186	0.179	0.07	0.44	0.00
SY4 - Integration	1.114	0.435	0.00	0.67	0.00
SY5 - Adaptability	1.158	0.231	0.01	0.51	0.00
SY6 - Usability	1.149	0.003	0.98	0.28	0.01
SY7 – Overall system performance	1.175	0.494	0.00	0.74	0.00
Service quality					
SV1- Customer experience	1.292	0.38	0.00	0.70	0.00
SV2 - Reputable service	1.48	0.129	0.07	0.64	0.00
SV3 - Communication	1.312	0.412	0.00	0.72	0.00
SV4- Customer awareness	1.24	0.289	0.00	0.64	0.00

SV5- Overall service performance	1.287	0.266	0.00	0.64	0.00
Perceived value					
PV1- Price value	1.251	0.156	0.06	0.54	0.00
PV2- Price value	1.501	0.124	0.16	0.63	0.00
PV3- Price value	1.451	0.358	0.00	0.74	0.00
PV4- Time value	1.705	0.25	0.03	0.60	0.00
PV5- Time value	1.843	-0.029	0.75	0.57	0.00
PV6- Time value	1.494	0.143	0.11	0.58	0.00
PV7 - Emotional value	1.406	0.451	0.00	0.79	0.00
Behavioural intention					
IT1- Reuse	1.345	0.501	0.00	0.78	0.00
IT2- Reuse	1.361	0.485	0.00	0.80	0.00
IT3 – Use other website	1.02	0.418	0.00	0.53	0.00
IT4 – Recommend	1.3	0.891	0.00	0.99	0.00
IT5 – Recommend other website	1.3	0.196	0.11	0.62	0.00

Table 15: Modified measurement model: VIF, Outer Weight and Loading Significance

Indicators	Outer VIF	Outer Weight	Outer Weight, P-value	Outer Loadings	Outer Loadings, P-value
Information quality					
IF1 -Accuracy	1.251	0.273	0.001	0.614	0.00
IF3 - Informativeness	1.271	0.073	0.416	0.504	0.00
IF4 - Informational Fit-to-Task	1.314	0.152	0.064	0.582	0.00
IF5 - Effectiveness	1.323	0.172	0.035	0.607	0.00
IF6 – Different choices	1.228	0.181	0.043	0.551	0.00
IF7- Clear photo	1.347	0.377	0.000	0.747	0.00
IF8 - Overall information performance	1.385	0.305	0.001	0.726	0.00

System quality					
SY1 - Accessibility	1.13	0.196	0.004	0.499	0.00
SY3 - Reliability	1.133	0.44	0.052	0.444	0.00
SY4 - Integration	1.108	0.232	0.000	0.67	0.00
SY5 - Adaptability	1.158	0.015	0.014	0.511	0.00
SY6 - Usability	1.123	0.51	0.867	0.276	0.01
SY7 – Overall system performance	1.14	0.196	0.000	0.739	0.00
Service quality					
SV1- Customer experience	1.292	0.125	0.000	0.636	0.00
SV2 - Reputable service	1.48	0.409	0.084	0.72	0.00
SV3 - Communication	1.312	0.285	0.000	0.638	0.00
SV4- Customer awareness	1.24	0.263	0.000	0.637	0.00
SV5- Overall service performance	1.287	0.238	0.000	0.499	0.00
Perceived value					
PV1- Price value	1.251	0.124	0.057	0.633	0.00
PV2- Price value	1.501	0.359	0.169	0.738	0.00
PV3- Price value	1.451	0.25	0.000	0.598	0.00
PV4- Time value	1.705	-0.029	0.028	0.568	0.00
PV5- Time value	1.843	0.142	0.748	0.58	0.00
PV6- Time value	1.494	0.451	0.122	0.792	0.00
PV7 - Emotional value	1.406	0.392	0.000	0.706	0.00
Behavioural intention					
IT1- Reuse	1.345	0.485	0.000	0.784	0.00
IT2- Reuse	1.361	0.418	0.000	0.796	0.00
IT3 – Use other website	1.02	0.891	0.000	0.53	0.00
IT4 – Recommend	1.3	0.196	0.000	0.985	0.00
IT5 – Recommend other website	1.3	0.156	0.109	0.624	0.00

4.4 Inner model evaluation

The next step after measurement model assessment of PLS-SEM is assessing the structural model which refers to the inner model evaluation (Hair et al., 2019). Structural relationships require initial assessment. Structural model coefficients for the relationships between the constructs are derived from estimating a series of regression equations (Hair et al., 2019). Prior to this process, testing the collinearity can ensure it does not bias the regression results. This process appertains to the latent variable scores of the predictor constructs in a partial regression used to calculate the VIF values. Similar to the previous criteria for formative measurement models, the ideal VIF values should be 3 or lower (Becker et al., 2015). Table 16 presents the result. All VIF values were below 3, thereby confirming no issue of collinearity. Next, the two predictive powers of in- and out-samples require examination. For in-sample, standard assessment criteria suggested by Hair et al. (2019) include the coefficient of determination (R^2), the blindfolding-based cross validated redundancy measure (Q^2) and the statistical significance and relevance of the path coefficients. For the model's out-of-sample prediction, the 'PLSpredict' procedure was applied (Shmueli et al., 2016).

Table 16: Inner VIF values

	Information	Perceived value	Recommend	Reuse	Service	System
Information					1.431	
Perceived value			1.000	1.000		
Recommend						
Reuse						
Service		1.000				
System					1.431	

4.5 In-sample predictive power

To inspect in-sample predictive power, the measures of coefficient of determination (R^2) and cross-validated redundancy (Q^2) are required, and Table 17 presents the results. By running the 'PLS-SEM algorithm', the R^2 measuring the variance is used to explain each of the endogenous constructs (Hair Jr et al., 2014). The R^2 effect ranges from 0 to 1 with 1 representing complete predictive accuracy. Given that R^2 is embraced by a variety of disciplines, excessive reliance on

R^2 can prove problematic. As illustrated by Hair, the R^2 will increase even if a non-significant but slightly correlated construct is added to the model. Therefore, even if the R^2 of this study is not in the higher level of 0.75 or above, this figure is not an index for poor predictive power, and Q^2 as a means to assess the inner model's predictive relevance must be considered. The Q^2 measure ran by 'blindfolding' building on a sample re-use technique can omit a part of the data matrix, estimate the model parameters and predict the omitted part using the estimates. Expressly, a Q^2 value larger than zero for an endogenous construct indicates the path model's predictive relevance for this particular construct. All endogenous constructs in this study (shown in Table 17) were positively larger than zero, showing its certain level of predictive relevance. As emphasised by Hair, researchers should take heed of the following: although comparing the Q^2 value to zero is indicative of whether an endogenous construct can be predicted, it does not mean anything about the overall quality of the prediction, especially when both R^2 and Q^2 are focusing on in-sample only (Rigdon, 2014; Sarstedt et al., 2014). The out-sample predictive power must thus be considered particularly as well.

Table 17: Results of R^2 and Q^2

Endogenous construct	Question Indicator	R^2	Q^2
Service quality	SV1-SV5	0.486	0.202
Perceived value	PV1-PV7	0.392	0.146
Reuse	IT1-IT3	0.243	0.109
Recommend	IT4, IT5	0.267	0.166

4.6 Out-sample predictive power

PLSpredict executing k-fold cross-validation can assess out-of-sample prediction (Hair et al., 2019). A fold means a subgroup of the total sample, and k is the number of subgroups. Through the process, the total data set is randomly split into k equally sized subsets of data. For instance, a cross-validation based on k = 5 folds splits the sample into 5 equally sized data subsets. PLSpredict then combines k - 1 subsets into a single analysis sample used to predict the remaining fifth data subset (Hair et al., 2019). This cross-validation process is then repeated k times with each of the five subsets used once as the holdout sample. Shmueli et al. (2019) recommended to set k = 10 generally; under this recommendation, Table 18 presents the results of root mean squared error

(RMSE). RMSE is defined as the square root of the average of the squared differences between the predictions and the actual observations (Hair et al., 2019). Given that the RMSE squares the errors before averaging, the statistic assigns a greater weight to larger errors, which makes it particularly useful when large errors are undesirable; more importantly, this process is typically the case in business research applications (Hair et al., 2019). The interpretation for PLS predict results focuses on the model's key endogenous construct as opposed to examining the prediction errors for all endogenous constructs' indicators (Shmueli et al., 2019). In most instances, researchers should use the RMSE; unless the prediction error distribution is highly non-symmetric, then, the mean absolute error (MAE) should be used instead. Table 18 demonstrates the data collected without the concern of non-symmetric compared RMSE and the results. Following the guidelines provided by Shmueli et al. (2019), we can see the majority indicators, 14 out of 17 approximate to 82.4% in the PLS-SEM analysis have higher RMSE values than in the naïve linear regression model (LM) benchmark. Relatively, only 3 indicators of IT1, IT2 and IT4 have lower RMSE values of LM benchmark. Generally, the results indicate a medium to high predictive power, particularly on its out-sample prediction (Hair et al., 2019; Shmueli et al., 2019).

Table 18: RMSE Results of PLS-SEM and LM

Endogenous construct	PLS	LM	LM > PLS
Service quality			
SV1- Customer experience	0.909	0.93	Yes
SV2 - Reputable service	1.002	1.016	Yes
SV3 - Communication	1.048	1.07	Yes
SV4- Customer awareness	1.049	1.077	Yes
SV5- Overall service performance	0.73	0.739	Yes
Perceived value			
PV1- Price value	0.882	0.904	Yes
PV2- Price value	0.948	0.953	Yes
PV3- Price value	0.957	0.959	Yes
PV4- Time value	1.154	1.195	Yes
PV5- Time value	1.076	1.092	Yes
PV6- Time value	0.985	1.03	Yes
PV7 - Emotional value	0.946	0.973	Yes

Behavioural Intention			
IT1- Reuse	0.801	0.769	No
IT2- Reuse	0.95	0.918	No
IT3 – Use other website	1.323	1.329	Yes
IT4 – Recommend	0.983	0.967	No
IT5 – Recommend other website	1.456	1.471	Yes

4.7 Summary of hypothesis testing

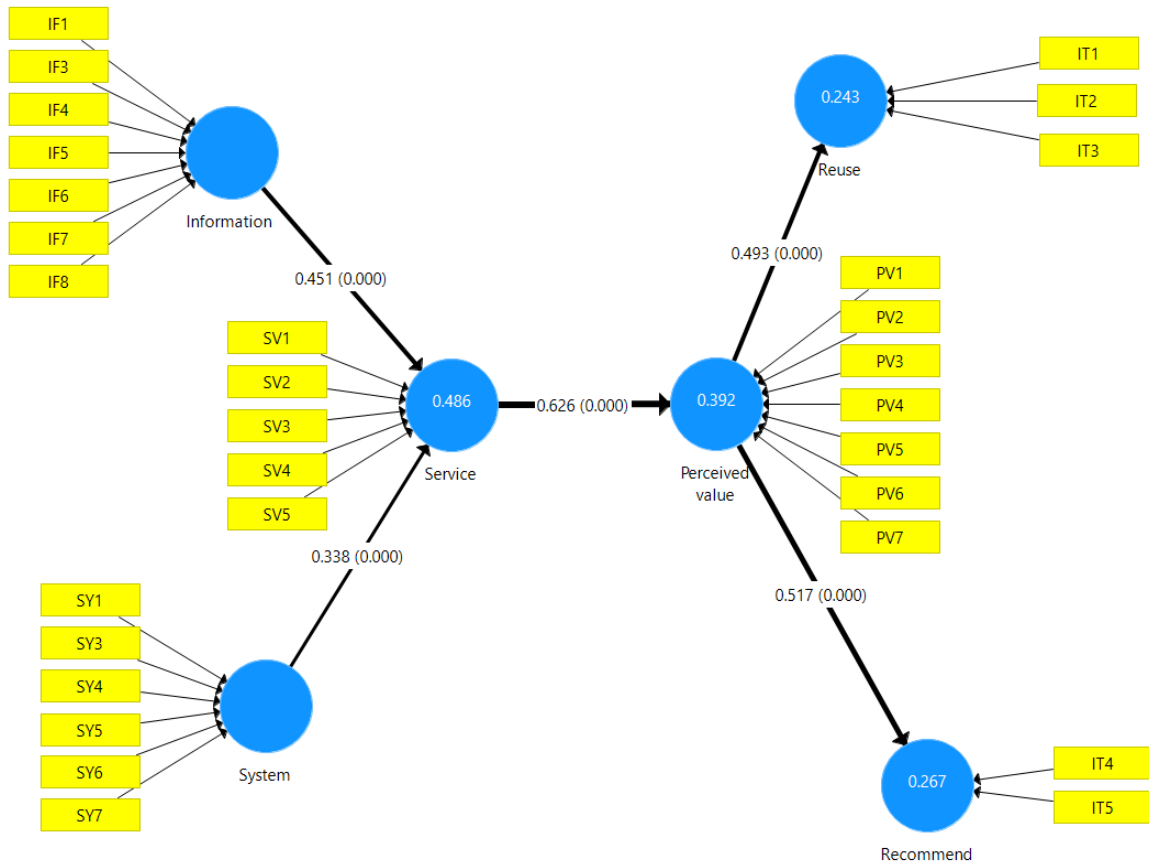
Bootstrapping with 5,000 subsamples was performed in SmartPLS (v.3.2.9) to obtain the standardised path coefficients, standard errors and p-value to assess the significance of each hypothesised relationship (Streukens & Leroi-Werelds, 2016). Table 19 presents the results of hypothesis testing, and Figure 4 illustrates the model path coefficients. Results show that all hypotheses of mobile website quality have a significant positive relationship with behavioural intention of reuse and recommend. Firstly, information and system qualities positively relate to service quality (H1: $\beta = 0.451$, $p < 0.05$ and H2: $\beta = 0.338$, $p < 0.05$, respectively). Related to both information and system qualities, service quality and perceived value have a significant relationship (H3: $\beta = 0.626$, $P < 0.05$). Meanwhile, the mediating hypotheses were also supported showing that perceived value (H4: $\beta = 0.493$, $P < 0.05$ and $\beta = 0.517$, $p < 0.05$) mediate the relationship between service quality and behavioural intention of reuse and recommend. Hence, all hypotheses from H1 to H5 are supported.

Table 19: Results of hypothesis testing

Hypothesis	Relationship	β	STDEV	P-value	Indirect effect	Result
H1: Information quality of mobile travel websites is positively related to its mobile website service quality.	Information -> Service	0.451	0.062	0.000	Nil	Supported
H2: System quality of mobile travel websites is positively related to its mobile website service quality.	System -> Service	0.338	0.057	0.000	Nil	Supported
H3: Mobile tourism website's service quality is positively related to perceived value of using it for travel products transaction.	Service-> Perceived value	0.626	0.035	0.000	Nil	Supported
H4: Mobile tourism website's service quality has an indirect impact on consumer's intention to reuse with it mediated by perceived value.	Service-> Perceived value-> Reuse	0.493	0.047	0.000	0.309	Supported
H5: Mobile tourism website's service quality has an indirect impact on consumer's intention to recommend with it mediated by perceived value.	Service-> Perceived value-> Recommend	0.517	0.044	0.000	0.324	Supported

Note: β : path coefficient, STDEV: standard error, p-value: $p < 0.05$ significant level

Figure 4: Path Coefficients of Conceptual Model



Note: significant path →, $p < 0.05$ significant level

4.8 Model goodness-of-fit

Whilst the traditional reflective covariance-based structural equation modelling (CB-SEM) strongly relies on the concept of model fit, this scenario is far less the case with PLS-SEM (Hair et al., 2019). Given that the algorithm for obtaining PLS-SEM solutions is not building on minimising the divergence between observed and estimated covariance matrices, the concept of Chi-square-based model fit measures and their extensions, such as Root Mean Square Error of Approximation (RMSEA), GFI (goodness of fit index), Comparative fit index (CFI) and normed fit index (NFI) used in CB-SEM reflective model are inapplicable (Hair et al., 2019). For PLS-SEM formative model, Henseler et al. (2016) defended that the only approximate model fit criterion implemented for PLS path modelling is the standardised root mean square residual (SRMR) which is the square root of the sum of the squared differences between the model-implied

and the empirical correlation matrix (Kante et al., 2018). The SRMR result generated by PLS-SEM algorithm of model fit in this study is < 0.074 , the cut-off value of 0.08 considered as good fit (Henseler et al., 2016).

4.9 Multiple group analysis

Multi-group analysis (MGA) is executed to test the path coefficients of the groups to determine if they are significantly different. To begin with, the measurement invariance of composite model (MICOM) is a pre-requisite criterion to ensure the validity of conclusions made (Sinkovics et al., 2016). By running the permutation test for MICOM, researchers ensure that dissimilar group-specific model estimations do not result from distinctive content and the meanings of the latent variables across groups. MICOM is a three-step approach including (1) configural invariance, (2) compositional invariance and (3) the equality of composite mean values and variances (Sinkovics et al., 2016).

For step 1, the permutation test of the SmartPLS (v.3.2.9) automatically established the configural invariance (C. Ringle et al., 2015; Garson, 2016), considering that the configural invariance assessment requires an inspection of the model set up developed earlier; thus, the statistical output does not apply to this step (Sinkovics et al., 2016). In step 2, Table 20 shows the results of compositional invariance with 5,000 permutations. As presented accordingly, all the c values in the original data are within the 95% confidence interval, supporting the null hypothesis that cannot be rejected. Consequently, no c value is significantly different from 1, assuming the compositional invariance of the conceptual model (Sinkovics et al., 2016). Step 3 evaluates the equality of means and cross-group variances. For this step, full invariance applies to both of the composite's means, and variance falls between the 2.5% and 97.5% boundaries (Sinkovics et al., 2016). As shown in Table 20: steps 3a and 3b, all the composite's means and variance fall in the 95% confidence interval range, presenting the full invariance of the data. To conclude, the results obtained in the MICOM analysis support 'full measurement invariance' for the two groups of data, contributing the pertinence of the MGA tests in this study.

Table 20: MICOM Results of the Conceptual Model

Composite (Step 2)	C value (=1)	95% confidence interval	Compositional invariance?
Information	0.884	[0.854; 1.000]	Yes
Perceived value	0.953	[0.86; 1.000]	Yes
Recommend	0.966	[0.91; 1.000]	Yes
Reuse	0.932	[0.836; 1.000]	Yes
Service	0.989	[0.924; 1.000]	Yes
System	0.962	[0.821; 1.000]	Yes

Composite (Step 3a)	Difference of the composite's mean value	95% confidence interval	Equal mean values?
Information	-0.1900	[-0.215; 0.214]	Yes
Perceived value	-0.1900	[-0.218; 0.215]	Yes
Recommend	0.0520	[-0.212; 0.211]	Yes
Reuse	0.1480	[-0.216; 0.215]	Yes
Service	-0.1480	[-0.216; 0.214]	Yes
System	-0.1580	[-0.214; 0.217]	Yes

Composite (Step 3b)	Logarithm of the composite's variances ratio	95% confidence interval	Equal variances?
Information	0.008	[-0.403; 0.420]	Yes
Perceived value	0.243	[-0.313; 0.294]	Yes
Recommend	0.043	[-0.350; 0.340]	Yes
Reuse	-0.095	[-0.340; 0.349]	Yes
Service	0.203	[-0.372; 0.380]	Yes
System	-0.198	[-0.328; 0.334]	Yes

Moving on to the structural model, MGA was performed to test the moderating role of how different types of mobile website quality affect consumer behavioural intention to reuse and recommend. Given that the distributional assumptions of the parametric approach fail to fit the distribution-free characteristics of the PLS path modelling method (Sarstedt et al., 2011) and in accordance with the review of available MGA methods in PLS path modelling (Henseler, 2012),

the permutation-based test procedure of SmartPLS (v.3.2.9) MGA function was adopted to compare groups by using 5,000 permutations for a high stability of results (Matthews, 2017). As shown in Table 21, no significant difference was found across two groups in terms of the path coefficients. The path coefficients of each group were in the range of 95% confidence intervals, and all of them demonstrated statistical significance with all p-values < 0.05. This finding signifies that all the constructs were correlated numerically, supporting all hypotheses viewed individually in group. For the two group comparison, using the unstandardised data, the multi-group permutation tests (final column on the right) showed no significant differences between the groups on any of the paths ($p > 0.05$). All β value results are in the range of the upper and lower bounds of 95% confidence interval, establishing no significant difference among two mobile consumer groups.

Table 21: Multi-group comparison test results

Relationship	Group 1: OTAs			Group 2: Direct Suppliers			Group 1 vs. Group 2	
	β	CI	p-Value	β	CI	p-Value	p-Value	Significance
H1: Information -> Service	0.464	0.263-0.618	0.00	0.486	0.258-0.658	0.00	0.873	No
H2: System -> Service	0.325	0.138-0.475	0.00	0.331	0.126-0.481	0.00	0.963	No
H3: Service -> Perceived value	0.616	0.466-0.688	0.00	0.633	0.489-0.711	0.00	0.813	No
H4: Perceived value -> Reuse	0.559	0.36-0.649	0.00	0.47	0.286-0.56	0.00	0.314	No
H5: Perceived value -> Recommend	0.609	0.451-0.691	0.00	0.468	0.303-0.555	0.00	0.082	No

Note: β : path coefficient, CI: 95% Confidence Intervals, p-value: $p < 0.05$ significant level

4.10 Importance-performance map analysis

Given the findings from MGA that two groups have no significant differences in terms of behavioural intentions, ferreting out other statistical insights on its importance and performance are efficacious to the study. Importance-performance map analysis (IPMA) is a useful analysis in PLS-SEM that extends the standard results reporting of path coefficient estimates by adding a dimension that considers the average values of the latent variable scores (Ringle & Sarstedt, 2016). In particular, by presenting a contrast of importance (i.e. total effect of predecessor constructs in predicting a target construct) and performance (i.e. average latent variable scores), IPMA can identify predecessors which have a relatively low performance but high importance for the target constructs (Ringle & Sarstedt, 2016). For example, a one-unit point increase in the performance of predecessor construct will increase the performance of target construct by the total effect size (i.e. importance) of the same predecessor construct (Schloderer et al., 2014; Ringle & Sarstedt, 2016). By defining two target constructs of behavioural intentions of reuse and recommend in this study, Table 22 displays the results of IPMA. As reflected, ‘perceived value’ is outlined to have the highest importance scores for both behavioural intentions of reuse (0.492) and recommend (0.737). In statistical terms, it means that if mobile website increases its perceived value by one unit point, its overall behavioural intention of reuse and recommend will improve by 0.492 and 0.737 correspondingly under the *ceteris paribus* assumption. Then, the second highest importance scores of ‘service’ referring to the same rule of any one-unit improvement of service quality, the intention of reuse and recommend will adequately raise to 0.316 and 0.473, respectively. Other than this result, the IPMA findings reveal that mobile website quality has the lowest performances on perceived value of 76.915 and service of 77.847, thereby connoting a room for enhancement. The next chapter on practical implications will present a detailed discussion for this finding.

Table 22: Importance-Performance Map Analysis for ‘reuse’ and ‘recommend’

	Importance of ‘Reuse’	Importance of ‘Recommend’	Performances
Information	0.161	0.241	79.117
Perceived value	0.492	0.737	76.915
Service	0.316	0.473	77.847
System	0.119	0.178	79.094

4.11 Chapter summary

This chapter discussed the distinction of formative model analysis. Firstly, this study investigated the outer measurement model and confirmed the valid measurement constructs. Secondly, the study examined the inner structural model by showing the model fit report and the multi-group analysis. In addition, this chapter adopted the importance-performance map analysis for unveiling other statistical insights into the conceptual model's performance. The next chapter presents the theoretical and practical implications as well as study limitations and suggestions following the findings of the data analysis.

Chapter 5: Discussion and conclusion

Chapter 5 elucidates the major findings of this study and deciphers those to scholarly contributions and practical implications. Following the three main research objectives mentioned in Chapter 1, this chapter firstly evinces all the predictive factors influencing consumers' perception of mobile website quality and dissects the relationships among consumers' perceived mobile website quality, perceived value and behavioural intentions. The interpretation of how this study contributes to academic theories and practical implications is discussed, and the discourse of research limitations and recommendations for future study are provided at the end.

5.1 Overall model performance

Rooted in extensive literature review on e-Tourism and m-Tourism, this study establishes a conceptual framework that specifies the relations among the constructs of mobile information quality, system quality, service quality, perceived value and post-purchase behaviours of reuse and recommend. By employing the mixed research methods of individual qualitative interviews and quantitative online questionnaires, formative indicators under each construct were examined. By conducting the pre-test with researchers and students in the field of tourism and hospitality, this study examined the appropriateness of the indicators. Following the feedback received from pre-test participants, all indicators were refined without the concern of vagueness; thus, all constructs are well in both contexts (Anderson & Gerbing, 1991). Similarly, the pilot test functions as a supplemental safeguard that helps test the reliability and validity of data collection instruments (Radhakrishna, 2007). The results of the pre-test show that the items in the questionnaire replicate the measurement constructs. The individual interviews function in exploring the most relevant indicators of mobile website quality and perceived value that existing literature rarely discovered and discussed. Subsequently, the online questionnaires reveal if any differences of perceived mobile website quality and post-purchase behaviours exist among mobile OTAs and mobile direct suppliers.

Different from the majority using the reflective model framework, this research has a novel attempt in developing the formative model. As explained in Chapter 4, the formative model is developed with all formative indicators. In particular, regarding the post-purchase behaviours of

reuse and recommend, two additional indicators in comparing how consumers would reuse and recommend the same used mobile website and the other mobile websites from the same firm are adopted. This attempt strengthens the model in terms of its uniqueness and more importantly contributes to the body of knowledge on structural equation modelling. Following the formative data analysis guidelines developed by Hair et al. (2019), for the outer model evaluation, the positive weights and the variance inflation factors all indicate the contribution of each indicator and its relevance under each construct. Afterwards, the inner outer model evaluation measuring model assessment reflects that the five hypotheses H1 to H5 are supported. Hence, with this justification of the standard data analysis procedures of both outer and inner model evaluations (J. F. Hair et al., 2019), the validity of this study is confirmed. This research can thus be generalised to the body of knowledge on mobile website quality and consumers' post-purchase behaviour.

5.2 Research objective 1: Identify factors affecting consumers' perceptions of mobile tourism website quality.

The results of this study indicate that the factors identified in this study have a positive influence on consumers' perceptions of mobile tourism website quality. That is, information, system and service qualities have a direct positive influence on mobile tourism website quality. This finding is consistent with the existing literature on tourism website quality that indicates information and system qualities as positively related to the overall service quality of tourism websites (Loiacono et al., 2007; Hsu et al., 2012; Wen, 2012; Zheng et al., 2013; Jeon & Jeong, 2017).

For mobile information quality, this study finds that the five factors of accuracy, informativeness, informational fit-to-task and effectiveness have a positive effect on consumer perceptions of mobile tourism website quality. This finding aligns with the study of Delone and McLean (2003) that indicates the importance of e-commerce content. The study shows that personalised, complete, relevant and easy-to-understand content ensures long-term relationships with online users (Delone & McLean, 2003). Specifically, the findings of this study show that the consumer's overall judgment and evaluation of the quality of information are assessed by the degree of accuracy, informativeness, timeliness and relevance of the information provided by the website. This study finds that accuracy has the highest positive influence on the information quality of a mobile tourism website; whilst informativeness, informational fit-to-task and the effectiveness of the

information quality are comparatively less important. Furthermore, the result of this study indicates that mobile consumers are more concerned about the accuracy of information as they are with the actual services provided on the mobile tourism websites. The results show whether mobile website provides detailed information. For example, full descriptions and detailed narratives for the tourism service are not that importantly contributing to the higher level of information quality perceived. Predictably, this dimension received the highest relative importance because a mobile website's hyperlinks are found to be highly influenced by the accuracy of the hyperlinks on the website (Pearson et al., 2012). The study indicates an additional finding as follows: the clear photos used in a mobile tourism website have a significant overall positive influence on the information quality of the website. These findings supplement the current body of knowledge on visual information and mobile website quality. Previous studies rather provide insights into factors, such as aesthetics (Pan et al., 2014) and the appealing nature of the website (Hung, 2018). The findings can further be linked to a study that shows aesthetic hotel photos strengthening the visual appeal and eventually improving service quality (Kirillova & Chan, 2018). These esthetical concepts highlight beauty as an important driver for information and service qualities.

With regard to system quality, the results of the data analysis show that accessibility, reliability, integration, adaptability and usability are found to have a direct and positive influence on the system quality of the tourism mobile website. This finding is supported by studies that indicate the following: when consumers are accessing tourism websites, the websites should have a stable and reliable performance. For example, the website is capable of integrating various information according to consumer's request; during the usage, no downtime happens and the overall system works smoothly with a user-friendly system design (Saeed & Abdinnour-Helm, 2008; P. Wang et al., 2017). Overall, system quality is previously investigated in more general terms, such as the investigation into the positive relationship between system quality and customer satisfaction (Abbaspour & HazarinaHashim, 2015; Chung et al., 2015). Concretely, system integration in this study is found to contribute significantly to the overall system quality. The fundamental definition of system integration refers to the way the system allows data to be integrated from various sources to enable effective decisions (Wixom & Todd, 2005). This finding is consistent with the results of previous research that mobile service providers must improve system quality to ensure service quality improvement and adoption (Zhou, 2011). These findings are in harmony with past studies that indicate the following: consumers recognise the importance of easy access to relevant tourism

information and system quality (Wen, 2012; Hsu et al., 2012). Wen (2012) indicated that convenience is important, whilst Hsu (2012) focused on consumer perceived flow in relation to system quality. The result of this study is logical in the sense that the given system quality is playing a supporting role for the entire website. Its functions in integrating information and maintaining its stability are crucial for consumers to enjoy a smooth website usage.

Noticeably, the checking transaction status is found to have an insignificant impact on system quality, and limited studies are investigating this factor in relation to system quality. In addition, this study is linked to their findings as it provides a more specific indicator of transaction record for further scrutiny under the construct of system quality. The result of this study shows that consumers do not care if the mobile website could show the transaction status, whilst the rest of the other weighted factors reveal that consumers focus more on the process when using the system rather than the final stage of consumption in showing the transaction record.

In terms of service quality, this study finds that reputable service, communication and customer awareness have a positive impact on the service quality of mobile tourism websites. These results are supported by studies that show highly reputable mobile websites that are aware of their users' needs and thus provide other relevant services to users. For instance, consumers may occasionally prefer to talk directly to a service personnel; thus, direct communication is the important factor affecting the overall mobile website service quality (Jeon and Jeong (2017) Hsu et al. (2012). Furthermore, the findings show that consumers' expected experience and awareness have an overall and positive impact on service quality. This finding is supported by a study that shows service quality as the degree of discrepancy between consumers' expectation and their perceptions of the service performance (Tsang et al., 2010). Furthermore, the results suggest that consumers find the direct communication of customer representatives as a strong indicator of service quality. This finding demonstrates that although consumers rely heavily on subsisting functions, they still need the personal connection with the service representatives. This finding is especially true in the tourism environment where most experiences are perceived as highly hedonic in nature (Eroglu et al., 2005). Remarkably, reputable service is found to have the least positive impact on service quality. This finding contradicts previous research that shows reputable service contributing significantly to website service quality (Jeon & Jeong, 2017b; Kim & Lee, 2005). The difference in the outcomes of these studies may be attributed to the fact that they investigated computer

desktop websites and not mobile websites. Furthermore, the reputation of the actual hotel brand and the hotel advertisement used in the study of Jeon and Jeong (2017) may have a direct impact on the consumer's perceptions of the actual website's reputation, hence the difference in the outcomes of these studies.

In a brief conclusion, these results testify that all 18 indicators are pertinent to mobile website quality. Hence, the first research objective of identifying factors affecting consumers' mobile website quality perception is attained.

5.3 Research objective 2: Examine the relationships among mobile website service quality, perceived value and behavioural intentions

From the results of PLS-MGA, all direct paths in two-group subsamples have supported the positive relationships among mobile website service quality, perceived value and behavioural intentions of reuse and recommend. The results of this study express that when both information and system qualities are influencing service quality, information quality has a stronger influence than service quality. This finding is supported by research that indicates the following: hotel mobile websites with high levels of information quality are likely to achieve higher evaluations of perceived value (Wang & Wang, 2010). Their study found that the mobile hotel reservation system with high information quality can increase consumer's perceived value when making hotel reservations. Meaning, when consumers can systematically and easily find the relevant hotel information using the mobile hotel reservation system, all the perceived information has its value. Consequently, they are willing to book the hotel rooms. However, this finding is contradictory to a study that shows service quality as more important than information quality (Hsu et al., 2012). The discrepancy may be attributed to the fact that Hsu et al. (2012) focused on the impact on customer satisfaction and purchase intention and not on whether the customer intends to reuse and recommend. This finding then indicates that information quality may have a stronger influence than service quality on customers' intention to reuse and recommend; whereas service quality may have a stronger influence than information quality on customers' purchase intention. Prominently, this correlation applies not only on the direct suppliers (e.g. hotels) but also the intermediaries of OTAs.

This study also demonstrates that mobile website quality directly contributes to perceived value. This finding is supported by studies that show tourism websites with high service quality perceived by consumers to have positive perceived value (Hsin & Wang, 2011; Lien et al., 2011; Deng et al., 2013; Joung et al., 2016; Lu & Wu, 2018). The past studies reveal that if the online website can understand and provide the services their consumers need and promptly respond to the requests, all of these factors can strengthen the perceived value from the consumer's perspective. This finding is further supported by studies that are in the same line with the results which indicate the following: the higher the service quality perceived by consumers also increases the perceived value including time and money by consumers. The results here are rational as the mobile website with good service quality could generally help consumers find a worthwhile price. The latter refers to the price value perceived, whilst the consumption they made through mobile websites is more time efficient so as the time value perceived. Furthermore, the results confirm that service quality and co-occurrence indicator weights appeared in the construct of perceived value. Moreover, the item of 'reservation made from the mobile website was a time-saving transaction' was the only one out of the seven indicators with negative weight. Although the negative values result directly from the magnitude of correlations among indicators, this effect may occur even if collinearity is not a threat (Cenfetelli & Bassellier, 2009). With the minor negative value received (-0.030) and the other correlated positive indicators concerning perceived time value, suppressor effects could be interpreted as involved here (Cohen et al., 2013). This phenomenon occurs when one or more of the predictor variables explain the significant variance in other predictor variables otherwise not associated with the criterion (Cenfetelli & Bassellier, 2009).

Remarkably, under the construct of perceived value, two significant weights were found: 'the prices found on the mobile website were value for money' and 'consumers feeling happy during the mobile website usage time'. Hence, this result can be annotated as follows: when service quality is strongly affecting perceived value, finance and hedonics values are more substantial than time value perceived by consumers; this finding is crucial but has not been mentioned and explored in previous literature (Chang, 2013; Chiu et al., 2014; Escobar-Rodríguez & Carvajal-Trujillo, 2014; Kandampully et al., 2015; Prebensen & Rosengren, 2016). This finding is different from prior studies as the current study presents the differences in how perceived price and hedonic values are more influential than perceived time value; whereas the past studies only mentioned that all three perceived price, time and hedonics have the same impact without specifying which

one is more influential than the others. However, this finding is contradicted by a study that indicated value for money and emotional value as having a less important impact than cognitive effort (ease of use) and utilitarian value (convenience) on customer satisfaction (Mohd-Any et al., 2015). This finding may be attributed to the fact that the study of Mohd-Any et al. (2015) focused on desktop websites but not mobile websites. Thus, value for money and emotional value possibly have a more vital influence on mobile websites than desktop websites.

The current study finds that behavioural intentions of reuse and recommend are positively affected by perceived value. More specifically, this study finds time value, price value and experience value to positively influence behavioural intentions, reuse and recommend. This finding is supported by studies in tourism that show perceived value to have a positive influence on behavioural intentions (Williams & Soutar, 2009; Mohd-Any et al., 2015). The mediating role of perceived value between service quality and behavioural intentions of reuse and recommend also conform with existing studies for their positive correlations (Loiacono et al., 2002; Filieri et al., 2015). These studies indicated that entertainment value (innovativeness, visual appeal, integrated communications and emotion,) have a direct positive influence on reuse (Loiacono et al., 2002). The prior research found that consumer's intention to reuse and recommend the website basically results in their service quality perception and the level of perceived value. During the consumer's psychological process, when consumers find that the website can provide the services they need (e.g. ideal hotel rate and the recommended hotel location), consumers would consider these factors as the added perceived value. This finding implies that the website can actually assist them in travel planning. With all of the psychological processes, consumers typically have higher intention to reuse and recommend this website to the other. Evidently, the construct of experience value may consist of a multidimensional framework that has a direct positive influence on consumers in the field of tourism as indicated by Williams and Soutar (2009) and Prebensen and Rosengren (2016). Discernibly, this study finds that consumers are inclined to reuse and recommend other websites from the same company. This finding is novel in that a high tendency of consumers to reuse other websites from the same firm is not similar to 'would recommend'. More intriguingly, when comparing the results of 'reuse' and 'recommend' for the used mobile websites that consumers previously used for their tourism service consumptions, the inclination of 'would recommend' is significantly higher than 'reuse'. The study finds that consumers' perceived value of the mobile tourism website has an overall positive influence on whether consumers will

recommend the website. The results further indicate that customers are more likely to recommend the website than to reuse the website. The more active intention to recommend is possibly related to the nature of tourism; in particular, most of the participants used the mobile websites for their leisure purposes and the nature of tourism more on happiness in relation to recommending the usage of the mobile website. To decipher the relationships of perceived value and behavioural intentions further, we can comprehend that perceived value is strongly associated with intentions to reuse and recommend for both used mobile websites and other websites under the same firm, whilst consumers tend to recommend more actively for the used mobile website than reuse it. In summary, with all the discoveries of the relationships explored and addressed here, the second research objective examining relationships of the service quality among mobile tourism websites, perceived value and intention to reuse and recommend are achieved.

5.4 Research objective 3: Investigate the differences in consumer post-purchase behaviour between mobile OTAs and direct suppliers' website

The third research objective is to investigate the differences in consumer post-purchase behaviour (reuse and recommend) between mobile OTAs and direct suppliers' websites. The multi-group analysis using both measurement invariance of composite model and the permutation test of the SmartPLS (v.3.2.9) found that no significant difference in post-purchase behaviour exist between OTAs and direct suppliers' mobile tourism website.

This result is intriguing and not anticipated. It contradicts current research on mobile tourism websites. Researchers argue that consumers' perceptions of the website quality vary depending on the type of website (del Carmen Suarez-Torrente et al., 2016; Li et al., 2017). However, the current study is different from them, as it defines perceived value in a more comprehensive scope including price value, time value and hedonics value. The previous studies instead found that online post-purchase behaviour is rooted in quality perceptions (Al-dweeri et al., 2017; Cao et al., 2018) and mediated by perceived value (Hsin & Wang, 2011; Lien et al., 2011; Deng et al., 2013; Joung et al., 2016; Lu & Wu, 2018). Particularly, given that website quality consists of information quality, system quality and service quality (Delone & McLean, 2003), all of these qualities are heterogeneously appertaining to website attributes (Chen et al., 2010; Liu et al., 2013) and website functionality (Wang et al., 2015; Li et al., 2017). Thus, it supports the argument that different types

of mobile websites would have different levels of post-purchase behaviours. In addition, this study highlights specifically perceived price, and hedonics are more influential than time value from the mobile consumer's perspective. Moreover, the study contributes to the new finding which is different from the prior studies as it states the following: regardless of the mobile website category, consumers' intentions to reuse and recommend are the same.

5.5 Theoretical contributions

This study contributes to the academic literature in four main ways. Firstly, the thesis contributes to the body of knowledge on mobile website quality in the tourism and hospitality industry by indicating information quality as the most important factor influencing the quality of mobile websites. Divergent from previous studies examining website quality from three individual constructs: information, system and service qualities and all of these studies focus on how each website quality is constructed, particularly affecting the overall website quality (Hsu et al., 2012; Chung et al., 2015; Tsao et al., 2016; Wang & Lin, 2017). This study initially proposed that mobile website quality should be examined by service quality which presents the overall IS success (Delone & McLean, 2003) and is affected by information and system qualities. This maiden research model was founded on the essence that website quality is defined as the overall excellence or effectiveness of a website delivering intended messages to its viewers (Jeong et al., 2003); therefore, it should be customer service oriented (Chang & Chen, 2008). The results largely support the following findings: similar to website quality evaluation in hospitality and tourism (Law et al., 2019), favourable information and system qualities facilitate the evaluation of service quality and further spill over perceived value, resulting in the positive behavioural intentions of reuse and recommend. Specifically, for information quality, uncommonly used indicator of a clear photo sets up the new page of typical esthetical concepts used in previous literature (Pan et al., 2014, Hung, 2018), that is, not only the appealing visual photos are tied to higher information quality, but clearness also stands out in the mobile setting.

Secondly, the thesis adds to the body of knowledge on SEM methodology and tourism studies by adding the formative approach as a measure to determine the influence of mobile website quality on consumer post-purchase intentions. In SEM, the most common type of measurement used is the reflective measure (Cenfetelli & Bassellier, 2009), emphasising that indicators under the

specific contrast must be correlated (Xu et al., 2019). This study dissents from this promoted idea and infrequently advocates the formative approach as the more appropriate way for this study, as this approach offers new discoveries. The rationale behind is that for mobile website quality, not all indicators are always correlated essentially (Xu et al., 2019). For example, regarding mobile website quality, two indicators of in-depth description of services and clear photos presented under the construct of information quality can be unrelated (Wen, 2012). Consumers would think that the mobile website provided detailed information (e.g. hotel location, hotel facilities), but unclear photos are shown for hotel rooms. Similarly, for behavioural intentions, indicators of ‘consumers would recommend the used mobile website’ and ‘would recommend other website from the same firm’ are not correlational. Hence, in this context, formative approach disregarding the internal consistency (Xu et al., 2019) is a better way for model assessment and subsequently contributes further to the formative studies.

Thirdly, the thesis contributes to the body of knowledge on consumer behaviours by determining the factors and the impact of mobile website quality on consumer’s intentions to reuse and recommend the mobile tourism websites. For the factors, under the construct of information quality, the indicator of information accuracy is found significantly important in mobile tourism website. For system quality, this study reveals that consumers do not care whether the system can present their transaction records, but the system integration and stability are crucial for them during the usage. As regards service quality, consumers care much about their experience when using the mobile tourism website. They expected that all the services provided are based on their needs, implying that the website is aware of their requests. Particularly, in the behavioural intentions, this study which pioneered adding two indicators of reuse and recommend other websites from the same firm are also the avant-garde approaches in academic study. Given that traditional studies focused on the behavioural intentions for the same purchased websites (Ha & Im, 2012; Rita et al., 2018), the questions involving the other websites under the same firms are scarcely found. Initiating different new theoretical approaches, this study plays the role of not only contributing other formative studies to digital marketing literature but also inspiring other academic researchers to eliminate the common reflective approach and attempt the formative approach when appropriate.

Finally, the thesis adds to the body of knowledge on mobile marketing in hospitality and tourism by indicating the moderated influence of the type of website on consumer intentions to reuse and

recommend. Particularly, this research sheds light on the contribution of consumer behaviour studies by comparing the similarities and differences between mobile OTAs and direct suppliers' websites. With the features and advantages of mobile technologies and the different services provided by mobile OTAs and direct suppliers, consumers' preferences, perceptions towards mobile website quality and their post-purchase behaviours might be divergent. The present research provides empirical shreds of evidence on the similarities of two groups. The findings reveal that even two groups with different tourism services provided, the way consumers assess their mobile website quality and post-purchase behaviour influenced by perceived value are nearly identical. Specially, consumers largely view information quality on photo clearness, that is, when they receive further information when they see visual information more clearly; whereas for system quality, system integration is the most crucial for mobile consumers nowadays; the indicator of system integration may be slowly replacing the ordinary system qualities of accessibility, and reliability emphasised heavily in the previous literature (Saeed & Abdinnour-Helm, 2008; P. Wang et al., 2017). Moreover, the concept of perceived value in the current study endows to the body of knowledge on consumer value. The conception of perceived value employed in this study was founded from the comprehensive literature and individual in-depth interviews, with its combination of the perceived price value, perceived time value and perceived emotional value. These findings could further enrich the consumer value studies.

To conclude, by considering all four major theoretical contributions, this study not only sets several new attempts in academic studies but also embellishes the mobile consumer behaviour body of knowledge. With the growing popularity of information technologies and mobile engineering advancements, this study enriches a pedantic approach and foundation regarding the perspectives of online consumer behaviour in the hospitality and tourism context.

5.6 Practical implications

Further implications of the results of the study relate to implications for practice. The findings from the data analysis are meaningful when juxtaposed onto practical implications to the tourism industries. The study's implications for management are twofold: 1) contribution to marketing teams and mobile engineers on the improvement of mobile website quality and 2) how to enhance mobile consumer's behavioural intentions to reuse and recommend.

The finding shows that clear photos applied on mobile website are found to have a significant positive influence on information quality and result in high correlation with service quality. Departments of marketing teams and mobile engineers should heed to the basic complexity regarding the differences between mobile and desktop websites (Kim, 2013). For all tourism practitioners including OTAs and direct suppliers, adopting mobile responsive web design in which building a website adapts its presentation to the mobile device on which it is being viewed is highly recommended (Riggs, 2017). They should also ensure that photos shown on mobile website comply with high quality standards, such as the best image resolution of 640 x 320 pixels (Filippini et al., 2005). Furthermore, considering the importance of photo quality functions in shaping the first impression of consumers (Gao & Bai, 2014), managers are advised to employ professional photographers who are capable of capturing higher-level photos and with a sense of aesthetic value, such as a composition that balances the elements of classic (e.g. symmetry vs. asymmetry) and expressive (e.g. colour) aesthetics (Kirillova & Chan, 2018).

Regarding system quality, the results show that mobile websites do not perform well when consumers are checking their transaction status. This finding specifies the scope of improvement of the IT department or Systems Engineering. Technically, a design of 'transaction acquiring' used by mobile apps is proposed to present transaction status that can be used as a reference when re-designing the mobile website. Allowing customers to check their transactions easily, transaction acquiring is the server component that accepts an initial transaction from customer applications and initiates the transaction within the system (Regan et al., 2015). Lastly, service component which includes service representative speaking directly to consumers can be ameliorated or provided through automotive information systems. Given that the different types of enquiries have different levels of urgency; companies could allocate manpower accordingly. If consumers are due to travel shortly, they would directly approach a sales representative. Visually, this kind of information must be adequately conspicuous for customers' awareness. A hint of using eye-catching colour highlighting this information is recommended.

The results of IMPA analysis reflect that the improvement of perceived value will promote consumer's intentions to reuse and recommend. Particularly, perceived time has a significant positive impact on perceived value and eventually on consumer intention to reuse and recommend. The finding shows that consumers perceive the website as very prompt. Consumers generally

disagree that using mobile websites could save their time. Perhaps, this disagreement concerns the aforesaid matters of system and service qualities, when consumers spend extra time determining where to find the transaction status or ways to contact service representatives they perceived to have no time efficiency. Hence, once those areas are improved, perceived value is also believed to improve.

Penetratingly, the results not only provide solutions for companies to improve their current mobile websites used by consumers but also offer assistance to consumer behavioural intentions to the same company's other websites. Findings indicate that consumers are likely to reuse other websites from the same firm but least likely to recommend. Accordingly, using promotional incentives such as referral schemes or referral programmes is recommended. Existing customers are rewarded for bringing in new customers, and incentives basically function as an extrinsic motivator to generate WOM (Kuester & Benkenstein, 2014). Practically, travel companies must design how to reward both WOM recommender and receiver, and the incentives should be mutually beneficial and exclusive under the referral programme. Depending on the considerations of cost and benefit, possible incentives include membership points, discounts, complimentary amenities, additional service (e.g. hotel's free late check out) or flexible reservation (extended late cancellation policy). Similarly, referral programmes should be developed on a continuous and accumulating basis to enhance the snowballing WOM effect among the target audience. This kind of information should be spotted easily by customers to arouse their interests to join. For example, extra eye-catching notice for this kind of promotion should be placed on the mobile website.

5.7 Limitations and future study

Despite the remarkable contributions of the current research, all studies contain limitations that require attention. The first limitation relates to the consumers' perceived mobile website quality. Although this study is founded on the highly cited and updated D&M IS Success Model, debates concerning other antecedents of IS success persist (Petter et al., 2013; DeLone & McLean, 2016). For this kind of debate, D&M candidly recognises it as the introduction of a new IS; alternately, the modification of an existing system subjects the organisation to both technological and social changes (Petter et al., 2013). Hence, this study used three fundamental website qualities (i.e. information, system and service) as mobile website quality evaluation still opens rooms for

considering other interdependent variables. The existing factors related to perception of mobile website quality and behavioural intentions which are free from three and perhaps more factors than the ones used by this research may be related. This limitation may provide opportunities for future research, such as the application and introduction of the Leavitt's model into such future research. Under the Leavitt's model, four different interdependent variables are included: tasks, people, technology and structure (Park & Kim, 2015). Accordingly, four other research questions about perceived mobile tourism website quality are 1) tasks: which type of tourism service do mobile consumers purchase? 2) people: which type of travellers are the mobile website users? 3) technology: what type of mobile system is provided by companies? and 4) structures: what is the organisational structure category of companies (e.g. the hierarchy or flexible structure)?

The second limitation refers the consumers' behavioural intentions. The research focuses on how mobile website quality influences consumer's intentions to reuse and recommend, presupposing that the direct outcome happened immediately after the mobile consumption. Actually, travellers might reuse or recommend the website after their travels and in the process, their own travel experience might alter their intentions. This study concentrates on IS system and did not explore how the subsequent travel experience relates to behavioural intentions. For example, would travellers be more influential than the others if they experienced a great travel time and are thus found to have a higher likelihood to 'reuse' and 'recommend'? Questions such as this one, are left to future studies. Forthcoming research might consider using the theory that examines how the attitudes of reuse and recommend would change as a result of mobile website quality and actual personal experience of travel and potential theories including the theory of reasoned action (Montano & Kasprzyk, 2015) or the Engel, Kollat and Blackwell (EKB) Model (Han et al., 2020).

The exclusivity of Chinese native-speaking individuals as the only respondents of the study may result in another limitation. Chinese respondents would be a variation to the result and analysis. Some researchers indicated that Chinese consumers differ from their Western counterparts in terms of positive WOM under the Chinese face culture (Fong & Burton, 2006; X. Zhang et al., 2019). Such culture is concerned with people's sense of worth, dignity and identity, associated with issues such as image, respect, honour, status, reputation and competence (Oetzel et al., 2008). Although Lien et al. (2018), through their study, rejected the statement that Chinese face culture would enforce positive WOM in online banking, the possibility that the desire of mobile consumers to

‘show off’ their travels (Zhang & Tse, 2018) by recommending the use of that mobile website should not be neglected given the different nature of tourism and that most of the respondents were leisure travellers. Hence, future researchers are urged to answer this call for an emic understanding of Chinese consumers’ perceived mobile website quality and their behavioural intentions.

Last but not the least, this study only examined the mobile website quality of two OTAs and direct suppliers. Future researchers are invited to cross-validate the generalisability across other contexts, such as last-minute mobile reservation websites or group-buying mobile websites. In addition, this study employed the mixed research method, and the utilised quantitative data analysis is predominantly more on the quantitative basis. Owing to the ambiguity of information encoded in variables and intrinsic limitation of statistical procedures. quantitative analysis may not frequently allow a meaningful theoretical interpretation (Gelo et al., 2008). Therefore, future research should conduct a qualitative-oriented study redeeming such limitations for the sake of a pedantic understanding of mobile website quality and behavioural intentions.

5.8 Chapter summary

The final chapter discussed the key findings and insights to address the research objectives. Contents of this part include measurements of mobile website quality and the relationships of mobile website quality, perceived value and behavioural intentions. Both academic and practical insights were provided with details and examples and finally the research limitations and suggestions for future study.

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Appendix 1: English online survey

Dear Survey Participant,

Thank you very much for taking this survey! The purpose of this survey is to examine certain aspects when consumers using mobile tourism website. Please note that ‘mobile website’ here in this survey refers to the website you visited using any mobile devices and it is not related to “mobile apps” that you need to download for installation. Your information will help the tourism industry to better improve the customer service quality.

Your participation is voluntary. You can withdraw from completing the questionnaire at any time, if you feel uncomfortable. The survey will take less than 15 minutes to complete. All the questions are related to your personal experience. The survey is anonymous and all data will only be reported in an aggregated form.

If you need assistance or have questions while taking this survey, please contact me.

Thank you again for taking this survey.

Janelle Chan
PhD candidate
The University of Southern Queensland
Email: u1101526@uemail.usq.edu.au

1. Have you ever visited any tourism websites on mobile device (i.e. smartphone or tablet) to purchase any tourism products (e.g. to book a hotel) in the past 12-month?
 - Yes
 - No

2. You answered 'Yes' for previous question, please state the name of that mobile tourism website you used before. (You can state more than one websites you have used frequently).
 - Online travel agency (e.g. Ctrip/ Fliggy): _____
 - Direct supplier (e.g. hotel official mobile website): _____

Please indicate the extent of your agreement with the following statements about your experience of using that mobile tourism website. (1-Strongly disagree, 2- Disagree, 3- Somewhat disagree, 4- Neutral, 5-Somewhat agree, 6- Agree, 7- Strongly agree)

	1 Strongly disagree	2 Disagree	3 Somewha t disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree
3. The information provided by the mobile tourism website was accurate.							
4. The travel website presented customized information.							
5. The travel website provided in-depth descriptions of its services.							
6. The information on the Website was pretty much what I need to carry out my tasks.							
7. The information on the Website was effective.							
8. The mobile tourism website provided me different choices for my decision-making.							
9. The mobile tourism website presented the clear photos that helped me understand the tourism product/service.							
10. In general, the mobile tourism website provided me with high-quality information.							

11. The mobile tourism website made information easy to access.							
12. The mobile tourism website enabled me to get on to it quickly.							
13. The mobile tourism website performed no downtime during my usage.							
14. The mobile tourism website effectively integrated data from different areas.							
15. The travel website has the characteristics to easily correct technical problems related to booking of travel products							
16. I have an access to check the status of my transaction.							
17. In terms of system quality, I would rate the website highly.							
18. The lodging website provided the exact service quality I expected or desired.							
19. The lodging website's service offerings matched its rating.							
20. The mobile tourism website understood the needs of their customers.							
21. Please choose (strongly disagree) for this question.							
22. I could speak with a representative at the mobile tourism website in case I have problems with my account.							
23. Overall, the mobile tourism website was							

good in its service quality.							
24. Price on the mobile website were acceptable.							
25. The booking through the mobile website was considered to be a good buy.							
26. The prices found from that mobile tourism website were value for money.							
27. The time spent in making this purchase from the mobile website was less than other ways.							
28. Reservation made from the mobile website was a time-saving transaction							
29. Reservation made from the mobile website was the right choice if saving time is considered.							
30. This experience using that mobile tourism websites made me happy.							
31. I predict I would use this website in the future.							
32. I intend to use mobile hospitality services in the future.							
33. I predict I would use the other website from this company to search for tourism information in the future.							
34. I would recommend this website to other people.							
35. I would recommend the other website from this company to other people.							

36. What is your gender?

- Female
- Male

37. What is your age?

- 18 to 24 years
- 25 to 34 years
- 35 to 44 years
- 45 to 54 years
- 55 to 64 years
- Age 65 or older

38. What is your education level?

- Completed some high school
- High school graduate
- Completed some college
- Associate degree
- Bachelor's degree
- Completed some postgraduate
- Master's degree
- Ph.D., law or medical degree
- Other advanced degree beyond a Master's degree

39. What was the primary purpose of your last trip?

- Business
- Visiting family, relatives, and / or friends
- Pleasure (e.g., vocation, relax, shopping honeymoon)
- Attending a conference, meeting, exhibition, seminar or other forms of educations
- Religion
- Health (e.g., hospital, examination, operation)
- Others (Please specify_____)

(The end)

Appendix 2: Chinese online survey

各位问卷调查参与者,

非常感谢您参加这项问卷调查。通过这项问卷调查, 我们想更有效地了解您使用移动旅游网站时的消费体验。

请注意, 本次调查中所指的“移动网站”是指您使用任何行动装置 (例如:智能手机或平板电脑) 浏览的网站, 此移动网站与需要下载安装的“行动应用程序 (apps)”无关。我们希望这些资料能够帮助旅游业界更有效地改善客户服务质量。

这份问卷调查大约需要不多于 15 分钟完成。您可以随时退出填写调查表。

这个问卷调查是匿名和自愿性质的, 所有资料将只以汇总形式报告。如果您在参加本问卷调查时需要帮助或有任何问题, 请与我们联系。

再次感谢您的参与!

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1. 在过去的12个月中，您是否曾经使用任何行动装置（例如：智能手机或平板电脑）浏览任何旅游网站以购买旅游服务（例如：预订酒店）？
 - 是
 - 不是

2. 您在上述问题中回答“是”，请列出您使用的网络平台 and 类型（您可以列出多于一个最常用的）：
 - 旅游网络平台 OTA, (如: 携程, 飞猪): _____
 - 直销平台, (如: 酒店官网): _____

根据您使用该移动旅游网站的经验，您同意或不同意以下的说法？（其同意程度为：1 非常不同意，2 不同意，3 有些不同意，4 中立，5 有些同意，6 同意，7 非常同意）。

	1 非常不同意	2 不同意	3 有些不同意	4 中立	5 有些同意	6 同意	7 非常同意
3. 该移动网站提供的资料是准确的。							
4. 该网站提供了可定制的资料。(例如：可按指定日子查询房价)							
5. 该网站提供了详细的旅游服务描述。(例如：酒店位置, 房间种类/设施, 入住及退房时间)							
6. 该网站提供了足够的资料使我完成预订。							
7. 该网站提供了有效资料。							
8. 该网站提供了不同的选择帮助我作出购买决定。							
9. 该网站提供了清晰的图片帮助我了解该旅游产品/服务。							
10. 一般来说，该移动网站提供了良好质量的资料。							
11. 该网站的系统使资料容易搜索。							
12. 该网站的系统容易使用。							

13. 在我使用期间, 该网站系统很顺畅。							
14. 该网站系统能有效地整合相关资料。 (例如: 在指定日期下提供不同酒店 房种选择)							
15. 该网站系统可以容易修改预订有关的 技术问题。(例如:酒店入住日子输入 错误可以容易作出修正)							
16. 该网站的系统可以显示我的交易状 态。							
17. 就系统质量而言, 我认为该网站是良 好的。							
18. 该网站提供的服务跟我的预期相符。							
19. 该网站的服务与其评分或等级相符。							
20. 该网站服务能理会旅客的预订需求。 (例如: 预订酒店后提供预订凭证)							
21. 请选择 (非常不同意) 在此项。							
22. 在预订过程中如遇上问题, 我可与网 站服务员联络。							
23. 总体上, 该移动网站的服务是良好。							
24. 通过该网站预订的价格可以接受。							
25. 通过该网站预订是划算的。							
26. 在该网站所找到的价格是物有所值 的。(例如:酒店星级与房价相符)							
27. 在该网站预订所花的时间比其他方式 少。							
28. 使用该网站预订是省时的。							

29. 如果考虑时间因素的话,通过该网站预订是正确的选择。							
30. 在我整个使用移动网站的经验中,我感到愉快。							
31. 我估计将来有机会的话我会再使用这个网站。							
32. 我打算将来再使用这个网站。							
33. 有机会的话,我估计我会使用“该公司的其他网站”。							
34. 有机会的话,我会向其他人推荐该网站。							
35. 有机会的话,我会向其他人推荐使用“该公司的其他网站”。							

36. 您的性别?

- 男性
- 女性

37. 您的年龄?

- 18 至 24 岁
- 25 至 34 岁
- 35 至 44 岁
- 45 至 54 岁
- 55 至 64 岁
- 65 岁以上

38. 您的最高教育水平?

- 高中以下学历
- 高中学历
- 专科学历
- 本科学历
- 硕士学历
- 博士学历
- 其他 (请在下面说明) _____

39. 您的工资是多少？（每月人民币计）？

- <6000 元
- 人民币 6000-7999 元
- 人民币 8000-9999 元
- 人民币 10,000-12,999 元
- 人民币 13,000-15,999 元
- 人民币 16,000-19,999 元
- 人民币 20,000 元或以上

40. 您上一次旅行的主要目的是什么？

- 生意商务
- 探望家人，亲戚和/或朋友
- 娱乐休闲（例如：释放压力，休闲度假，观光购物，渡蜜月）
- 参加会议，会议，展览，研讨会或其他形式的教育
- 宗教
- 医疗健康（例如：医院身体检查，手术）
- 其他（请注明_____）

(问卷结束)