

## **Determinants of User's Intentions to Book Hotels: A Comparison of Websites & Mobile Apps**

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# **Determinants of User's Intentions to Book Hotels: A Comparison of Websites & Mobile Apps**

## **Abstract**

**Aim:** This empirical study uses the stimulus-organism-response (S-O-R) framework to examine the interrelationships amongst hotel websites and app quality, flow, telepresence, user engagement, and booking intentions.

**Methodology:** Data from two different datasets, including users of hotel websites ( $N_{\text{sample1}}=257$ ) and hotel mobile apps ( $N_{\text{sample2}}=292$ ), were collected. Partial Least Squares based (PLS-SEM) was used to test the research model. Furthermore, multi-group analysis (MGA) was conducted to compare the model across both segments.

**Findings:** Findings indicate that the quality of the hotel websites and mobile apps both positively influence telepresence, flow, and engagement. Telepresence and flow positively affect the users booking intentions for both the samples. However, for hotel website users, engagement has a non-significant effect on booking intentions. Finally, telepresence has a non-significant effect on flow, and flow has a non-significant effect on engagement for both the users of hotel websites and mobile apps.

**Originality:** This study is exceptional. It uses two datasets to understand how hotel booking channel (hotel website and mobile app) quality leads to booking intentions by tapping into telepresence, flow, and engagement.

**Keywords:** Website Quality; App Quality; Engagement; Flow; Telepresence

## **Introduction**

Recent advances in digital technologies have reshaped consumers' decision-making process in planning and searching for hotel accommodations (Lee et al., 2020). With the transition to the information age materialized by the rise of the internet, and the internet of things, traditional reservation and booking systems employing telephone, fax, and travel agencies, have simply been eclipsed to make way for websites and mobile applications (Fong et al., 2017). Websites and apps have different functions that enable consumers to carry out routine tasks (Wang et al., 2015). Both hotel websites and mobile apps have features including self-check-in and check-out requests, special service requests, and communication with the hotel staff. Moreover, consumers' evaluations of websites' attributes and features play a considerable role in purchasing decisions (Wang et al., 2015). It is expected that 700 million people by 2023 will book their hotel rooms online via either hotel websites or mobile apps. However, with the rapid expansion of online hotel bookings, limited information regarding guests' behaviors toward hotel websites and mobile apps is available due to their various features and advantages (Wu & Law, 2018). Therefore, it is essential to identify and analyze the guests' behaviors towards hotel websites and mobile apps for effective management of online distribution channels in multi-channel environments.

As hotel websites and apps help consumers interact and navigate through virtual environments, such interactivity provides a real-world experience referred to as telepresence (Li et al., 2017). Telepresence measures how a consumer indirectly experiences their future purchase experience (Algharabat et al., 2018). Experiencing telepresence when interacting with a stimuli website or app will likely enhance purchase intentions. Ali (2016) explained that hotel websites capable of instilling a flow state are likely to derive satisfaction and an inclination toward

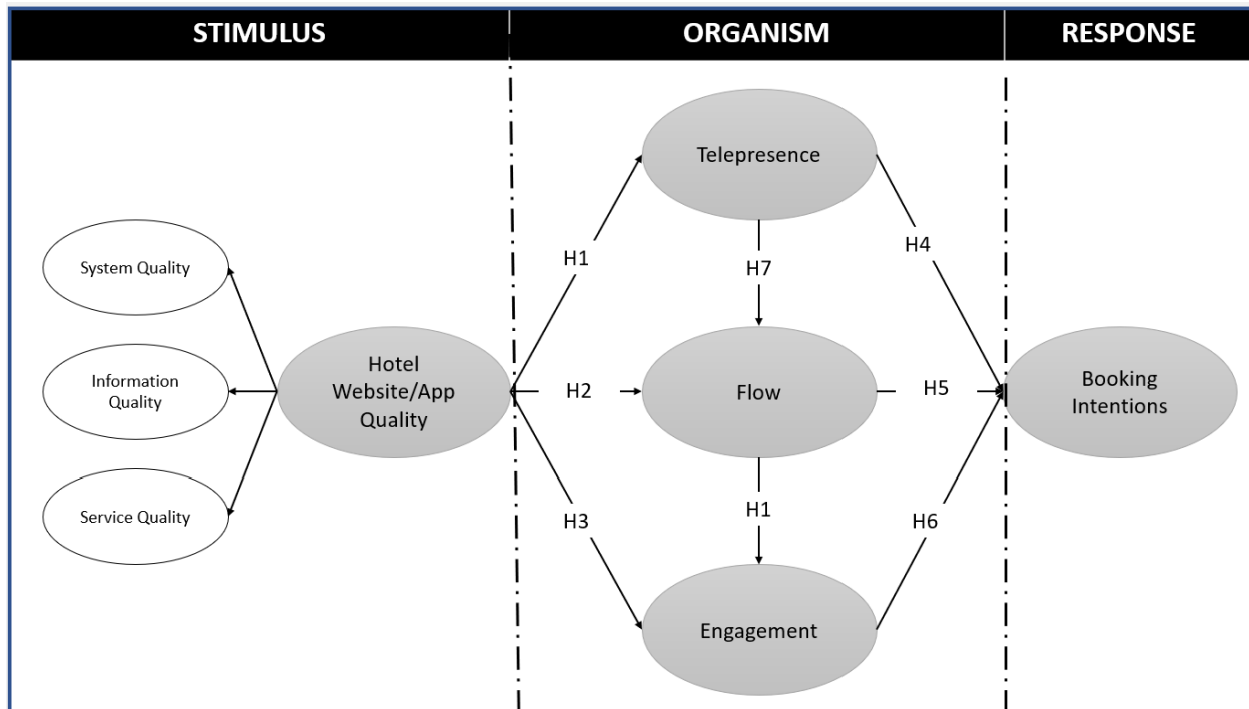
revisiting behaviors. Several studies assessed the importance and relevance of flow for understanding customers' behavior within online settings (Thatcher et al., 2008). Furthermore, recent research demonstrates the positive influence of customer engagement on businesses, leading to enhanced customer relationships and higher purchase intentions (e.g., Hollebeek et al., 2014; Tussyadiah et al., 2015).

Notwithstanding the industry's requirement and skyrocketing adoption of websites and apps to evoke telepresence, perceived flow, and customer engagement, empirical studies on their consequences in the hospitality context are still scarce. The notion of flow in online environments garnered interest from scholars; however, very few studies focused on its effect in the context of hotel websites and apps. Similarly, numerous studies have investigated the antecedents of telepresence (e.g., Choi et al., 2016; Ongsakul et al., 2020; Lee et al., 2020). However, few studies examined the relative impact of hotel websites and apps as an antecedent of telepresence, flow, and customer engagement in a single study. In addition, the interrelationships between website and app quality, flow, telepresence, engagement, and booking intentions have not been investigated. Considering these gaps, the present study provides a supplemental understanding of the associations between website quality and other variables that determine purchase and behavioral intentions in online environments. Accordingly, this investigation aims to (1) identify the impact of website and app quality on flow, telepresence, and user engagement, (2) determine the effects of flow, telepresence, and user engagement on booking intentions; and (3) evaluate the influence of telepresence and user engagement on flow in the hotel industry. The stimulus-organism-response (S-O-R) is used as a theoretical base for the research model.

## **Literature Review**

### ***Theoretical Background***

The S-O-R framework can be portrayed as "a parsimonious description of environments, intervening variables, and behaviors" (Donovan & Rossiter, 1982, p.36). The framework was introduced by Mehrabian and Russell (1974), who proposed the existence of a stimulus (S), which acts as a trigger to produce changes in consumers' internal and organismic (O) states, eliciting behavioral responses (R) manifested as approach or avoidance toward the system. The S-O-R model has been widely applied to consumer-related studies (Ali et al., 2021; Zhu et al., 2020) and used as a theoretical base for understanding consumer behavior within online environments (Zhang & Xu, 2016; Liu & Zhang, 2014). For example, the S-O-R model was employed by Leung et al. (2021) in their study examining customers' perceptions of self-service kiosks' performance. Comparably, Ali et al. (2021) integrated the S-O-R model with the Information System Success Model (Delone & McLean, 2003) to evaluate the impact of smartphone travel apps' quality on user engagement and behavioral intentions. In line with the studies above, this study employed the S-O-R framework as a theoretical base for evaluating hotel website and app quality influences on consumers' booking intentions. Drawing on previous literature, this study assumes that both website and mobile app quality (S) will influence flow, telepresence, and engagement (O), which together will contribute to shaping behavioral intentions (R). The conceptual model is illustrated in Figure 1.



**Figure 1. Conceptual model**

### *Hotel Websites and App Quality*

Because of its critical role in creating customers' purchase intentions, website and app quality have gotten much attention from academics and practitioners alike. Chang and Chen (2008) proposed the concept of website quality as *"users' evaluation of whether a website's features meet users' needs and reflect the overall excellence of the website"* (p. 821). On the other hand, hotel mobile app develops an interactive relationship with customers by providing information through mobile devices (Ongsakul et al., 2020). Therefore, the quality of mobile apps influences customers' attitudes towards the hotel and their booking intentions. Customers engage with multiple touchpoints by logging in with the hotel app, which allows them to engage with numerous content, share information, and make bookings (Wang et al., 2015).

A successful online strategy for websites and apps representing a hotel is only possible

through a thorough understanding of the attributes of these channels (Hernandez et al., 2009; Wang et al., 2015). Several scholars advanced that a good website/mobile app design can boost marketing and sales efforts (Garcia, 2016). Most researchers agree on the multidimensionality of website/mobile app quality (e.g., Ali, 2016; Canziani & Welsh, 2016; Salem & Cavlek, 2016; Wang et al., 2015; Wang & Law, 2020). However, there is no consensus on those dimensions. This multidimensionality of website/mobile app quality led researchers to investigate its components. For instance, Au Yeung and Law (2004) proposed usability and functionality, while Pavlou et al. (2007) put forth privacy and security. Prior research on website quality also noted the importance of information quality, system quality, ease of use, service quality, and responsiveness as dimensions of website quality (Ali et al., 2021). Delone and McLean were pioneers in evaluating website quality through the dimensions of system quality, information quality, and service quality (Delone & McLean, 2003). Moreover, Ali (2016) indicated that system quality, information quality, security, and privacy are influential factors in developing customers' perceived flow, resulting in customer satisfaction and purchase intentions on online hotel websites.

This study uses information quality, system quality, and service quality as the leading indicators to assess the hotel website and app quality. Information quality refers to content provided by the company to the consumers (Chen & Cheng, 2009), such as multimedia, images, and texts online. It is also defined as the "*users' perception of the quality of information presented*" (McKinney et al., 2002, p. 299). Information quality is identified through the quality of content displayed on the website or app (Delone & McLean, 2003; Chen & Huang, 2013) and the relevance, timeliness, personalization, and accuracy of that information (Zhang et al., 2015).

Service quality is often used to measure customers' overall evaluation of services offered and delivered by the website/mobile app (Chen et al., 2016; Zhang et al., 2015). Service quality is an important aspect that evaluates the service provider's performance (Chatterjee et al., 2018). Ali et al. (2021) explained that aspects such as reliability and responsiveness are to be considered for measuring service quality. System quality measures how the system allows for a technically sound, user-friendly, and error-free environment for the user to interact with the website or app (Ali et al., 2021). Eom et al. (2012) included usability, download time, reliability, availability, and adaptability in the system quality domain. As well, convenience, response time, and flexibility also represent essential facets of system quality.

### ***Flow***

The concept of flow appeared first in academic literature in 1975 with Csikszentmihalyi, who defined it as "*the holistic experience that people feel when they act with total involvement*" (p. 36). Csikszentmihalyi (1975) argued that customers are likely to perceive their experiences as positive when in a flow state. When in a flow state, customers become much involved with the given activity, losing self-consciousness and control of the environment (Gao & Bai, 2014). The advent of the internet provided opportunities to facilitate the manifestation of flow (Chen et al., 1999; Hsu et al., 2012), especially by allowing customers to be involved in a virtual environment. Flow state is an essential aspect of computer-human interaction, much more experienced in online settings (Jeon et al., 2019). Earlier studies involving flow had signaled marketers' importance in creating experiences eliciting positive flow, mainly due to its positive influence on customers' attitudes and intentions to revisit a website (Matwhick & Rigdon, 2004) and mobile apps.



The concept of flow is relevant to hotels' online presence. Undoubtedly, hotel websites and mobile apps have become central for customers to seek information about a hotel and book their stays. Most hotel websites nowadays incorporate visuals (pictures and video) to enhance customers' online experience and make other customers' reviews and feedback available on the website (Gao and Bai, 2014). With regards to flow experience when visiting a hotel website or app, Gao and Bai (2014) proposed flow as "*a temporarily unaware experience, where an individual engages in an online travel-related activity in a travel website or app with total concentration, control, and enjoyment*" (p. 655). Flow is likely to enhance engagement, as consumers' sense of time becomes distorted while in a flow state (Pellet et al., 2016). Ultimately, a flow state reveals that the individual has an enjoyable experience. Previous research assessed that flow in online environments enhances customer engagement (Carlson et al., 2017; Mollen & Wilson, 2010). Thus, hospitality organizations must identify web-based and app-based attributes that would be the most likely to prompt flow experience and foster positive consumer behavior (Jeon et al., 2019; Lee, 2018).

### ***Telepresence***

The concept of telepresence was first proposed by Minsky (1980) to describe people's state of being *transported* through a system. Telepresence refers to the psychological sense of feeling present in a remote environment (Algharabat et al., 2018; Ongsakul et al., 2020). If consumers are presented with a simulated perception of that reality, the term telepresence is more relevant (Steuer, 1992). Telepresence thus refers to this phenomenon occurring when customers transcend the physical environment and interact with a virtual environment portraying a simulated perception of the desired reality. The notion of being virtually present within interactive settings

is noted in early investigations involving the concept of telepresence (e.g., Klein, 2003; Lim & Ayyagari, 2018; Sukoco & Wu, 2011). Certain scholars postulated that interactivity with a website and app stimulates telepresence, leading to desirable attitudes and behaviors for hoteliers (Mollen & Wilson, 2010). Therefore, hotel websites and apps need to enable customers the sense of being psychologically transported in the environment formed by the website and mobile app. High telepresence can be created by embedding rich media such as video, audio, and animation to enhance website and apps' vividness and user immersion (Algharabat et al., 2018; Steuer, 1992). Because consumers generally rely on physical cues to make inferences before experiencing a product, telepresence is critical in shaping purchasing decisions in the online context, especially for experiential products such as accommodation (Weathers et al., 2007). Empirical studies have revealed that creating high telepresence for the Web-based exchange platform can enhance customers' perception of the service offering of interest (Algharabat, 2018).

### ***Engagement***

The notion of engagement denotes the continuous aspect of customers' interactions with a product (Fang et al., 2017). Although engagement was examined across several disciplines, such as information systems, marketing, and service management, there are disagreements regarding its definition, conceptualization, and operationalization (McLean, 2018). Earlier conceptualizations of engagement involved curiosity, focus on appeal (Jacques et al., 1995), and interactivity (Quesenbery, 2003). User engagement is considered a multi-dimensional construct, manifested through a psychological process, a behavioral manifestation, and a motivational psychological state (Fang et al., 2017). Hollebeek et al. (2014) referred to it as "*a consumer's*

*positively valence cognitive, emotional, and behavioral brand-related activity during or related to specific consumer/brand interactions"* (p. 154). Prior literature confirmed the importance of user engagement to foster sales value, satisfaction, brand attitude, and brand commitment (Kim et al., 2013; Cheung et al., 2011). Engaging customers by using a website and app is considered a crucial means for organizations to create long-term sustainable business relationships with customers and enhance future consumption (Dovaliene et al., 2015). Vivek et al. (2012) also noted that customer engagement could be initiated either by the company or customers themselves. As per Hollebeek et al. (2014), customer engagement mainly occurs during interaction with the company's offerings.

### ***Behavioral Intentions***

Customer behavioral intentions are widely used in hospitality and tourism literature, mainly due to their suitability to identify customers' purchase behavior (Hsu et al., 2012; Pelet et al., 2017; Wang et al., 2015). Customer behavioral intentions benefit from being easily measurable, as compared to monitoring actual behavior (Law, 2018). Behavioral intentions can be defined as "a stated likelihood to engage in behavior" (Oliver, 2014, p. 28). The importance of understanding customer behavioral intentions was early identified in the literature as signaling "*whether customers will remain with or defect from the company*" (Zeithaml et al., 1996, p. 33).

Customers' behavioral intentions may be favorable, for instance, with positive word-of-mouth and loyalty (Jain & Han, 2011; Ongsakul et al., 2020); unfavorable, with negative word-of-mouth or legal action (Fong et al., 2017; Ryu et al., 2012). Ongsakul et al. (2020) argued that consumer buying behavior is strongly influenced by the information they seek from the internet. Hotel websites and apps display products and services offered (Ali, 2016; Lim & Ayyagari,

2018) and are also the place for hoteliers to update information about their offerings. As such, hotel websites and apps have the potential to augment sales as they enhance customer awareness about products and service offerings at a hotel. Consequently, this study follows Ongsakul et al. (2020) definition of behavioral intentions as "*customer's favorable intentions to revisit the website and mobile app, make a transaction from it in the future, staying at the hotel and/or use the products/services shown on the website*" (p. 685)

## **Conceptual Model and Hypotheses Development**

### ***Stimuli and Organism***

According to Chang (2013), stimulus refers to an ensemble of cues and attributes people use to form their opinions. Following the S-O-R framework, the stimuli represent an ensemble of attributes and features influencing users' perceptions and internal states (Mazursky & Jacoby, 1986; Mollen & Wilson, 2010). The various attributes of websites and apps serve as cues provoking a reaction in consumers (Koo & Ju, 2010; Loureiro et al., 2019). Regarding the current study, stimulus refers to the website, and mobile app attributes consumers perceive and reflect through information quality, system quality, and service quality. Those environmental factors that constitute the stimuli affect consumers' organismic experiences as they interact with hotel websites and apps.

Sukoco and Wu (2011) explained that a website/mobile app uses multiple objects and contents, such as videos, sounds, and animated images, which are very determinant for users to acquire a clear sense of immersion. As such, perceptions of website quality were found to positively influence customers' emotional states (Forgas et al., 2012). Furthermore, several

studies confirmed the positive impact of website and app features and attributes on telepresence when interacting with online environments (Fiore et al., 2005; Lee & Kozar, 2006; Lim & Ayyagari, 2018). Therefore, in light of the preceding argument, the current study predicts a positive influence of hotel website and app quality on telepresence, leading to the following hypothesis:

*H1. Hotel website/app quality has a positive influence on telepresence.*

Wang et al. (2015) also explained that enhanced website quality leads to customer satisfaction when browsing. Moreover, website quality positively influences customers' emotional states, including enjoyment and anxiety (Forgas et al., 2012). Nevertheless, very few studies analyzed the impact of website quality and mobile apps on perceived flow. For instance, based on website quality components and features, Zhou et al. (2010) and Hsu et al. (2012) supported the relationship between website quality and perceived flow. Therefore, findings from those studies contended that hotel websites should be designed to elicit positive evaluations regarding the quality of the website, which can nurture perceived flow in consumers. As such, the following hypothesis is proposed:

*H2. Hotel website/app quality has a positive influence on perceived flow.*

A practical and quality system offers easy-to-interpret, accurate, and concise information that impacts consumer buying behavior, including user engagement (Barreda et al., 2015). In order to have consumers engaged, information available through websites and apps needs to present relevancy, personalization, and ease of understanding (Fang et al., 2017; Islam & Rahman, 2017; Noh & Lee, 2016). Another dimension of website and mobile app quality, service quality, was

assessed as leading to engagement with the system (Islam et al., 2019). It is also confirmed in previous studies (Arcand et al., 2017; Fang et al., 2017; McLean, 2018). Website and mobile app quality are crucial to consumer engagement, which is the key to conversions and revenue (Hsu et al., 2012; Kim and Baek, 2018; Tak & Gupta, 2021). In the context of smartphone travel apps, Ali et al. (2021) also found that information, system, and service quality positively impact customer engagement. More recently, Tak and Gupta (2021) found that the travel mobile apps' collaboration design and visual information influence consumer engagement. Therefore, we propose the following hypothesis:

*H3. Hotel website/app quality has a positive influence on customer engagement.*

### ***Organism and Response***

In the S-O-R model, the organism represents the series of internal processes between the stimuli and final responses as a function of consumers' evaluations. The resulting actions and behaviors correspond to the outcome manifested in the response (Islam & Rahman, 2017; Jiang et al., 2010). As mentioned above, website and mobile app quality factors constitute the stimuli that impact consumers' internal processes. These processes, denoted by telepresence, flow, and engagement, lead to booking intentions on the hotel website/mobile apps. According to Park et al. (2010), telepresence on websites leads to utilitarian and hedonic performance because of its influence in making fulfilling tasks efficient and enjoyable, leading to good behavioral intentions, including intentions to revisit the website and visit the hotel itself. Choi et al. (2016) also explain that telepresence developed via website quality features helps consumers perform tasks efficiently, which indicates the functional performance of the website. According to Smith and Sivakumar (2004), customers engage in positive behavior on a website extension of

telepresence. In a study on augmented reality-enabled mobile applications, Kumar (2021) indicated that telepresence is positively related to product purchase intentions through mobile apps. Telepresence allows customers to be immersed within the website and mobile apps, which has the potential to bring about positive behaviors when interacting with it (Gao & Li, 2019; Kumar, 2021). Following this rationale, the following hypothesis is proposed:

*H4. Telepresence has a positive influence on the booking intentions.*

Like telepresence, the impact of perceived flow is also extensively studied in human-computer mediated contexts, i.e., mitigating price sensitivity, attracting consumers, or intention to visit (Novak et al., 2003; Kabadayi & Gupta, 2005). Therefore, a consumer who perceives getting into flow while surfing the website and mobile app is more likely to generate intentions to purchase. Earlier studies recognized the positive relationship between perceived flow and behavioral responses (Sicilia et al., 2005; Sicilia and Ruiz, 2007; Fortin and Dholokia, 2005). Moreover, Animesh et al. (2011) claimed that flow significantly increases purchase intentions compared to telepresence. Hsu et al. (2012) also added that consumers experiencing a flow state when browsing a website were more likely to produce purchase intentions. More recent studies also found a positive relationship between perceived flow and booking intention in online contexts (Jeon et al., 2019). Therefore, the following hypothesis is posited:

*H5. Flow has a positive influence on booking intentions.*

Website and mobile app quality are crucial to consumer engagement, which is key to conversions and revenue (Hsu et al., 2012; Ongsakul et al., 2020; Tak & Gupta, 2021). For instance, several studies noted the positive relationship between customer engagement and

loyalty to a brand (e.g., Bowden, 2009; f et al., 2011; Hollebeek et al., 2014; Vivek et al., 2012). Papagiannidis et al. (2017) and Kumar et al. (2010) identified the positive association between engagement and purchase intentions. Sivadas & Jindal (2017) denoted that the positive outcomes of customer engagement translated into the propensity to spread word-of-mouth. Previous studies referred to the positive beliefs about a brand that arise when consumers engage with that brand (Hollebeek, 2011; UI Islam et al., 2017). In e-commerce settings, engagement was also found to influence online purchase and repurchase intentions (Rather, 2018). Therefore, it can be posited that customer engagement ultimately influences their ensuing responses. Therefore, the following hypothesis is posited:

*H6. User engagement has a positive influence on booking intentions.*

### ***Intra-Organism Processes***

The sense of telepresence while using websites and mobile apps can boost users' flow experience. Studies have found that users focus more on their virtual world activities when they experience so intensely the sense of telepresence that not enough attention is left to immerse anything (Animesh et al., 2011). The concept of flow—along with telepresence—is pertinent to interactions with a website, as demonstrated in prior studies (Sicilia et al., 2005; Coyle and Thorson, 2001; Sicilia and Ruiz, 2007; Nel et al., 1999; Hilde et al., 2009). Likewise, Ongsakul et al. (2020) also predicted that telepresence would likely enhance the perceived flow of interactions with online environments. Novak et al. (2000) also found a positive relationship between telepresence and flow in an online environment. The positive relationship between telepresence and flow is also supported by numerous studies in different contexts (Pelet, 2017). Novak et al. (2020) found that enhanced telepresence led to enhanced flow for interactions with



online environments. Some scholars have also stated that telepresence enhances the optimal flow experience in social media use (Pelet, Ettis & Cowart, 2017). Therefore, we propose the following hypothesis.

*H7. Telepresence has a positive influence on flow.*

Researchers have found flow as an antecedent of user engagement and identified numerous behavioral consequences (Carlson et al., 2017). The studies of Gao and Bai (2014) and O'Cass and Carlson (2010) argued that flow experience significantly influences purchase intentions, recommendations, and engagement. Moreover, Kim et al. (2019) claimed that flow is a significant predictor of online customer engagement. The perceived flow elicits attitudinal and behavioral reactions from customers, resulting in a prolonged motivation to continue the activity, thus engagement (Van Noort et al., 2012). Barker (2016) advanced that flow can also be viewed as a form of intense involvement, resulting in high psychological involvement. Carlson et al. (2017) explained that within the online environment, compelling and pleasurable experiences with the stimuli are likely to take the consumer into a flow state, bringing about customer engagement behaviors. Consequently, the following hypothesis is formulated:

*H8. Flow has a positive influence on user engagement.*

## **Methodology**

### ***Research Instrument***

This study's constructs were measured using previously validated instruments to ensure reliability and validity (see Table 2). Initially, to ensure the expressions' clarity and reliability of measurements, a pilot test was conducted with 50 respondents who frequently make their hotel

bookings online using either hotel websites or mobile apps. The pilot study results indicated that the Cronbach alpha of all the constructs was above the threshold value of 0.70. Minor changes were made based on respondents' recommendations about the wording of items and the overall formatting of the instrument.

### ***Data Collection***

The data for this study was collected from the population above 18 years old who frequently make hotel bookings online using either hotel websites or mobile apps. Two independent surveys were conducted separately from the users of hotel websites and mobile apps. The data was collected through Amazon Mechanical Turk (MTurk), an online platform increasingly helping hospitality and tourism researchers collect data and perform surveys (Ali et al., 2021). For both the surveys, the study participants were recruited based on a self-selection sampling technique as it allows participants to decide whether they are willing to participate in the research on their own accord. Further, to ensure the data quality, only those participants were recruited with a minimum of 95% Human Intelligence Task approval rate. Besides, two attention check questions were also included in the questionnaire. Participants who failed to pass the attention check questions and incomplete data were deleted from the data set. As a result, 257 responses from the users of hotel websites and 292 responses from mobile app users were deemed qualified for further analysis. The respondent profiles of both samples are shown in Table 1.

### ***Common Method Bias***

Since the data for this study was collected from a single source, several steps were taken to reduce common method bias. First, the response bias was limited in data collection by assuring

the confidentiality and anonymity of the participants' responses. Second, for each measurement scale, different cover stories were given to achieve psychological separation among respondents. Last, Harman's single factor test as a statistical investigation was employed. The results showed that for both the surveys, a single factor was extracted, which was 46.6% of the total variance from hotel booking websites and 40.6% of the total variance from mobile apps. Both the factors showed that CMB was not a serious problem as the factors from both datasets were less than 50%.

**Table 1. Sample Characteristics of the Respondents**

		Users of hotel website booking (N = 257)		Users of mobile app bookings (N = 292)	
		Frequency	Percentage	Frequency	Percentage
Gender	Male	111	43.2	139	47.6
	Female	146	56.8	153	52.4
Age	Below 20 years old	0	0	30	10.3
	21 – 30	28	10.9	166	56.8
	31 – 40	136	52.9	81	27.7
	41 – 50	72	28.0	14	4.8
	51 and more	21	8.2	1	0.3
Yearly Income	Below US\$20,000	15	5.8	75	25.7
	20,001 – 40,000	74	28.8	144	49.3
	40,001 – 60,000	157	53.3	66	22.6
	60,001 – 80,000	31	12.1	7	2.4
	80,001 and more	0	0	0	0
Education	High School	6	2.3	6	2.1
	Bachelors	72	28.0	90	30.8
	Masters and PhD	133	51.8	158	54.1
	Others	46	17.9	38	13.0
Marital Status	Single	0	0	271	92.8
	Married	257	100	21	7.2
Occupation	Student	14	5.4	81	27.7
	Private Sector	55	21.4	33	11.3
	Public Sector	8	3.1	7	2.4
	Business Owner	67	26.1	40	13.7
	Unemployed	113	44.0	131	44.9
Number of times used the channel	1 – 2 times	69	26.8	83	28.4
	3 – 5 times	85	33.1	83	28.4
	6 – 8 times	44	17.1	53	18.2
	9 – 11 times	28	10.9	47	16.1
	12or more times	31	12.1	26	8.9

## Data Analysis

This research employed Partial Least Squares-based Structural Equation Modeling (PLS-SEM) to examine the relationships between the constructs. PLS-SEM was chosen due to the non-normal distribution of data and the study's exploratory nature (Ali et al., 2018). The assessment of the measurement model for both the users of hotel websites and mobile apps is presented in Table 2. The results indicate appropriate convergent validity and reliability of both the samples (Ali et al., 2018). In addition, the values of average variance extracted (AVE) for all the latent constructs of both the samples are also greater than the accepted threshold of 0.5, which further approves the convergent validity of both data sets.

**Table 2. Assessment of the Measurement Model**

Constructs	Hotel Websites						Mobile Apps				
	Items	Loadings	CR	CA	Rho-A	AVE	Loadings	CR	CA	Rho-A	AVE
<b>System Quality</b> (Noh and Lee, 2015)		0.912	0.922	0.871	0.872	0.797	0.885	0.909	0.849	0.851	0.769
		0.930					0.905				
		0.833					0.840				
<b>Information Quality</b> (DeLone and McLean, 2003)		0.904	0.940	0.914	0.915	0.796	0.871	0.906	0.862	0.863	0.708
		0.913					0.872				
		0.870					0.794				
		0.881					0.827				
<b>Service Quality</b> (DeLone and McLean, 2003)		0.839	0.905	0.859	0.860	0.704	0.821	0.895	0.843	0.844	0.680
		0.842					0.841				
		0.871					0.830				
		0.803					0.807				
<b>Telepresence</b> (Ongsakul et al., 2020)		0.894	0.905	0.842	0.848	0.760	0.871	0.886	0.806	0.807	0.721
		0.839					0.809				
		0.882					0.867				
		0.802	0.859	0.756	0.780	0.670	0.777	0.856	0.749	0.762	0.664
<b>Flow</b> (Hsu et al., 2012)		0.778					0.814				
		0.874					0.852				
		0.908	0.919	0.867	0.873	0.791	0.909	0.918	0.865	0.873	0.788
<b>Engagement</b> (Fang et al., 2017)		0.915					0.907				
		0.843					0.846				
		0.845	0.912	0.872	0.873	0.722	0.803	0.865	0.792	0.794	0.617
<b>Booking Intentions</b> (Ongsakul et al., 2020)		0.860					0.819				
		0.844					0.731				
		0.849					0.787				

Fornell and Larcker's (1981) criterion and HTMT criterion were used to test the discriminant validity of the constructs for the datasets. Table 3 shows the results for both the tests and indicates satisfactory discriminant validity for the constructs in this study.

**Table 3. Discriminant Validity**

	Hotel Websites							Mobile apps						
	BI	ENG	FL	IQ	SQ	SYSQ	TP	BI	ENG	FL	IQ	SQ	SYSQ	TP
Booking Intention	<b>0.850</b>							<b>0.786</b>						
Engagement	0.579	<b>0.889</b>						0.576	<b>0.888</b>					
Flow	0.550	0.358	<b>0.800</b>					0.531	0.360	<b>0.815</b>				
Information Quality	0.730	0.582	0.500	<b>0.892</b>				0.512	0.462	0.418	<b>0.841</b>			
Service Quality	0.721	0.610	0.600	0.735	<b>0.800</b>			0.684	0.597	0.607	0.820	<b>0.825</b>		
System Quality	0.555	0.498	0.500	0.505	0.600	<b>0.893</b>		0.628	0.555	0.573	0.595	0.654	<b>0.900</b>	
Telepresence	0.629	0.776	0.400	0.587	0.700	0.481	<b>0.870</b>	0.601	0.499	0.554	0.478	0.596	0.500	<b>0.849</b>

### *Structural Model*

First, the structural model's multicollinearity was assessed using the variance inflation factor (VIF). The results from both the samples indicated that all the VIF values were under the threshold value of 5 and confirmed no multicollinearity issues. Next, bootstrapping procedure with sub-samples of 5000 was conducted to calculate the values of path coefficients, p-values, and R square (Table 4). The results contend that the quality of the hotel websites and mobile apps both positively influence telepresence (hotel websites:  $\beta=0.668$ ,  $p < 0.001$ ; mobile app:  $\beta=0.625$ ,  $p < 0.001$ ), flow (hotel websites:  $\beta=0.573$ ,  $p < 0.001$ ; mobile app:  $\beta=0.593$ ,  $p < 0.001$ ), and engagement (hotel websites:  $\beta=0.664$ ,  $p < 0.001$ ; mobile app:  $\beta=0.600$ ,  $p < 0.001$ ). As hypothesized, telepresence ( $\beta=0.365$ ,  $p < 0.001$ ) and flow ( $\beta=0.352$ ,  $p < 0.001$ ) positively affect the users of hotel websites booking intentions. Similarly, telepresence ( $\beta=0.377$ ,  $p < 0.001$ ) and flow ( $\beta=0.324$ ,  $p < 0.001$ ) also positively affect the booking intentions of mobile app users.

Thus, H1, H2, H3, H4, and H5 are supported.

**Table 4. Hypotheses Testing**

No	Hypotheses	Hotel Websites				Mobile App			
		Beta	P Values	F square	Results	Beta	P Values	F square	Results
H1	QUAL -> TP	0.668	0.000	0.806	Supported	0.625	0.000	0.641	Supported
H2	QUAL-> FLW	0.573	0.000	0.268	Supported	0.593	0.000	0.339	Supported
H3	QUAL-> ENG	0.664	0.000	0.522	Supported	0.600	0.000	0.353	Supported
H4	TP-> BI	0.365	0.000	0.107	Supported	0.377	0.000	0.105	Supported
H5	FLW-> BI	0.352	0.000	0.220	Supported	0.324	0.000	0.178	Supported
H6	ENG-> BI	0.170	0.067	0.024	Not supported	0.162	0.028	0.020	Supported
H7	TP-> FLW	-0.007	0.911	0.000	Not supported	0.023	0.732	0.001	Not Supported
H8	FLW-> ENG	-0.019	0.741	0.000	Not supported	-0.004	0.953	0.000	Not Supported

Hotel websites: R<sup>2</sup> = 0.521 (BI), R<sup>2</sup> = 0.446 (TP), R<sup>2</sup> = 0.322 (FLW), R<sup>2</sup> = 0.427 (ENG)  
 Mobile app: R<sup>2</sup> = 0.505 (BI), R<sup>2</sup> = 0.391 (TP), R<sup>2</sup> = 0.369 (FLW), R<sup>2</sup> = 0.357 (ENG)  
 (QUAL= quality; TP= telepresence; FLW= flow; ENG= engagement; BI= booking intention)

Interestingly, H6 was not supported for hotel website users and showed that engagement ( $\beta=0.170$ ,  $p > 0.05$ ) has no significant effect on hotel website users' booking intentions. While, for the users of mobile apps, the results were different by showing that engagement ( $\beta=0.162$ ,  $p < 0.05$ ) positively influences the mobile app users' booking intentions, and hence H6 was supported in the context of mobile apps. Finally, telepresence (hotel websites:  $\beta= -0.007$ ,  $p > 0.05$ ; mobile app:  $\beta=0.023$ ,  $p > 0.05$ ) has no significant effect on flow, and flow (hotel websites:  $\beta= -0.019$ ,  $p > 0.05$ ; mobile app:  $\beta= -0.004$ ,  $p > 0.05$ ) has no significant effect on engagement for both the users of hotel websites and mobile apps. Thus, H7 and H8 were not supported.

The results of R<sup>2</sup> and F<sup>2</sup> are also shown in Table 4. The results show that the hotel websites quality explains 44.6% variance in telepresence (R<sup>2</sup>= 0.446), 32.2% variance in flow (R<sup>2</sup>=0.322), and 42.7% variance in engagement (R<sup>2</sup>=0.427). Likewise, the mobile app quality explains 39.1% variance in telepresence (R<sup>2</sup>=0.391), 36.9% variance in flow (R<sup>2</sup>=0.369), and 35.7% variance in engagement (R<sup>2</sup>=0.357). All the constructs explain 52.1% variance in hotel website user booking intentions (R<sup>2</sup>= 0.521) and 50.5% variance in mobile app users' booking

intentions ( $R^2=0.505$ ). To measure the effect sizes ( $F^2$ ), well-established guidelines are used that is 0.35 for larger effects, 0.15 for medium effects, and 0.02 for small effects. The results of  $F^2$  showed that H1 and H3 have large effects, H2 and H5 have medium effects, and H4 and H6 have small effects for both hotel websites and mobile apps. At the same time, H7 and H8 have no effects.

## **Discussion and Implication**

Hotel websites and mobile apps are expedient sources of information for customers to generate their intentions and make booking decisions. However, while previous studies have focused on online booking intentions using either websites or mobile apps, the literature has yet to examine the relative impact of the hotel website quality and mobile app quality together in a single study. Therefore, this study is one of the first studies that examined the role of hotel website and app quality on customers' perceptions of telepresence, flow, and engagement leading to user booking intentions. The results for both the samples confirmed that both hotel website quality and mobile app quality lead to telepresence (H1), flow (H2), and user engagement (H3). It implies an excellent website and app quality confirmed to be valuable in rousing telepresence, perceived flow, and higher customer engagement, which further leads to their booking intentions. It implies that customers give importance to system quality, information quality, and service quality of the hotels websites and mobile apps to be virtually presented in the hotel through telepresence, get involved, and engage with the hotel. This study provides a theoretical lens on how hotel websites and mobile apps can be designed to achieve telepresence, flow, and engagement and increase hotel bookings. This study is significant in the research on hotel websites and mobile apps since these sectors are highly competitive, and the only way to achieve success is based on heavy

bookings (Dinsmore et al., 2017).

This study has also revealed the significant effect of telepresence on customer booking intentions (H4). Though the idea of telepresence has been tested empirically in many fields, including media, medicine, virtual reality and augmented reality, education, destination marketing, journalism, and websites (Ballantyne, 2002; Bracken & Skalski, 2010; Choi et al., 2016; Friedman & Kotzen, 2018; Kim & Hyun, 2016; Lee, 2018; Mollen & Wilson, 2010), few studies have focused on it in the context of hotel websites and apps. This study provides a comprehensive understanding of telepresence from the context of hotel websites and mobile apps by examining its antecedents and consequences, which shows a significant theoretical contribution of this study.

The findings also revealed that flow positively affects consumer booking intentions through hotel websites and mobile apps (H5). This outcome is consistent with the findings of Hsu et al. (2012). Additionally, the findings showed that consumers who understand hotel websites and mobile app quality are highly expected to perceive flow and engagement, leading to users' booking intentions while using mobile apps only (H6b). Interestingly, the results in the context of hotel websites found that customer engagement with the website does not demonstrate their willingness to book the hotel (H6a). The result contradicts previous studies on service marketing, where customer engagement is an essential element of online booking intention through websites (Ongsakul et al., 2020; Rather, 2018; Yusuf et al., 2018). It is probably because the quality of the hotel website exerts pressure on customer engagement which indicates that a unique hotel website can assert eagerness and excitement in customers to engage and make a booking. As such, engaged customers are more likely to spend their time with the unique website quality of the hotel. Hotel mobile apps offer those facilities available on websites, i.e., property



search, hotel information, reservation, etc., and offer innovative smartphone-specific services, including system intelligence, interactive maps, and location awareness (Wang et al., 2015). For instance, hotel mobile apps are based on users' locations, which automatically list nearby hotels to the customers when they search. Additionally, many hotel mobile apps feature loyalty programs and social computing, facilitating decision-making. Therefore, the website developers must deliver user-friendly features with trustworthy and reliable information to build a positive perception of hotels by going beyond customers' expectations. Such advancements in technology while using websites will stimulate consumers' curiosity and engage them in the experience, which can affect their behaviors and booking intentions.

The findings also demonstrated that telepresence does not enhance flow within hotel websites and mobile apps (H7). These results contradicted previous studies that showed telepresence leads to flow in online technology-mediated environments (Hoffman & Novak, 1996; Pelet, Ettis & Cowart, 2017; Tussyadiah et al., 2015). The findings revealed that the sensation of being in the hotel while using hotel websites and/or mobile apps does not mean they are fully involved (flow) with the website or app. Generally, the hotels can enhance and value customer experiences if they can predict and implement new technological advancements in their current systems (Magnini et al., 2003). For such purpose, more and more hotels are moving towards personalizing hotel experiences for their consumers via hotel websites and mobile apps, which requires disclosure of rich personal consumer information (Sutanto et al., 2013). Such consumers' personal information integrated with websites and apps can question their privacy, decreasing their involvement and engagement. It also justifies our findings (H8), showing that flow does not lead to website and mobile app users' engagement. Therefore, hotels should find creative ways to get consumers involved and engaged with the websites and mobile apps by

facilitating consumer-firm interactions. Hotels must ensure that consumers' privacy will be least compromised through transparency and dialogue. Hotels can also design interactions that arouse brand attachment, consumer emotions, and overall experience to get consumers involved and engaged in personalizing services (Bilgihan et al., 2015). For instance, utilizing gamification may stimulate consumer involvement and engagement in service personalization by offering vigorous rewards for discovering deals among the service offerings of hotels. Finally, hotels can assure consumers that their websites and mobile systems are secure and amenable to privacy standards. If the hotels succeed in winning consumer involvement and engagement, hotels can make better pricing and decisions. Therefore, providing a well-perceived website and mobile app quality is significant to increasing users' engagement and booking intentions towards a particular hotel.

### **Limitations and Future Suggestions**

Although the findings of this study provided numerous significant implications, there are still some limitations that can be addressed in future studies. First, this study has adopted a multi-dimensional scale for measuring hotel website and mobile app quality, such as information quality, system quality, and service quality. Future studies can include other essential attributes of websites and mobile app quality from the literature, including privacy, functionality and security, usability, etc. Second, this study has targeted only two groups of users: customers who make hotel booking via websites, and the other who use mobile apps. Future studies to further determine the differences can do comparative studies among the existing groups with those who use both the channels to make hotel bookings. Third, this study has measured telepresence as a unidimensional construct. Future studies may test telepresence as a multi-dimensional construct

while replicating the model. Fourth, the data for the study was collected online through MTurk, which can create an issue of generalization. Future studies can conduct a face-to-face survey for better results. Last, future studies can replicate the model in other contexts and industries.

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