

The impact of website quality on customer satisfaction and purchase intention: perceived playfulness and perceived flow as mediators

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Abstract The purposes of this study are to examine whether perceived playfulness and perceived flow would mediate the relationships among website quality, customer satisfaction, and purchase intention, as well as to assess the degree of reciprocity between perceived playfulness and perceived flow in an online travel agency context. This study suggested a research framework for testing the relationships among the constructs based on the stimulus-organism-response framework. In addition, this study developed a non-recursive model. After validating the measurement scales, empirical analyses were conducted using structural equation modelling. The findings confirm that website quality affects customers' perceived playfulness and perceived flow, and in turn, would influence their satisfaction and purchase intention. Notably, this study finds that the service quality is more important than information and system quality in influencing customer satisfaction and purchase intention. Furthermore, the study reveals that the relationship between perceived playfulness and perceived flow is reciprocal. Based on the findings, the implications are discussed in the paper and directions for future research are also highlighted.

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1 Introduction

The travel agency plays a significant role in the tourism industry (Mamaghani 2009) which is a key driver for socio-economic progress of the world as proposed by United Nations World Tourism Organisation (UNWTO). However, given the growing competition in the brick-and-mortar travel agency, nowadays, with the development of the Internet and e-commerce, websites have the potential to radically change the nature of the travel agencies business by providing online services (e.g. booking tickets) for customers 24 h a day and giving all the information they need which would influence their assessment of a business on the NET (Álvarez et al. 2007). Although it has been widely recognised that the Internet and the travel industry are highly compatible (Bennett and Lai 2005), travel agencies need to know how the website quality and the related variables that would guide the behaviour of their customers.

Previous researchers have proposed that website quality can directly affect customer satisfaction and lead to purchase intention (e.g. Bai et al. 2008; Chen and Cheng 2009). Therefore, further understanding the relationships between website quality and the related variables that affect satisfaction and purchase intention is the main concern of this study. This study will introduce two variables—perceived playfulness and perceived flow—that combine with website quality to exert a joint influence on customer satisfaction and purchase intention. Perceived playfulness and perceived flow are proposed as mediating variables; both are explored to verify their roles in the relationship among website quality, customer satisfaction, and purchase intention.

Taking customer's perceived playfulness into account is important because perceived playfulness reflects the perspective of the customer. Only the customer, not the online retailer can determine whether website quality leads to playfulness (Ahn et al. 2007). Specifically, customer-perceived playfulness is regarded as an outcome of website quality perceived by the customer in online retailing context. Thus, a customer-perceived playfulness is created when the customer perceives the website quality exceeds their expectations (Ahn et al. 2007), which, in turn, is believed to be the necessary variable that gives rise to behaviours such as satisfaction (Lin et al. 2005) and behavioural intention (Ahn et al. 2007). Furthermore, clarifying customers' perceived flow is crucial since flow is a state of consciousness experienced by individuals who are totally involved in an enjoyment activity (Pace 2004). Research has proposed that the web is an activity that can facilitate the occurrence of flow (Chen et al. 1999). The concept of flow refers to those optimal, extremely enjoyable experiences where an individual engages in an activity with involvement, concentration and enjoyment, and experiences an intrinsic interest as well as a feeling of time distortion during his/her engagement (Chen et al. 1999). Consequently, if the use of the web enables entry to a flow state, i.e. an enjoyable experience, users should ultimately be able to improve

their subjective well-being. Previous research (e.g. Webster et al. 1993) has proposed that flow is a useful construct for explaining general human–computer interactions. Specifically, flow has been examined in online environments (e.g. Novak et al. 2000; Thatcher et al. 2008; Wu and Chang 2005), and it is regarded as a useful insight into user behaviour. For this reason, it is useful to take the construct of flow into consideration in this study.

Although researchers have identified the major driving factors of customer satisfaction and purchase intention such as website quality, perceived playfulness, and perceived flow, the interrelationships among these constructs have not yet been investigated. Therefore, in light of the current gaps in the literature, understanding the relationships that exist between the aforementioned constructs and their effects on customer satisfaction and purchase intention are the key concern in this study that requires further investigation to verify their interrelationships.

2 Conceptual framework and literature review

2.1 Conceptual framework

A research framework which developed based on the stimulus-organism-response (S-O-R) paradigm is displayed in Fig. 1 (Eroglu et al. 2001, 2003). In the S-O-R framework, stimulus is characterised as an impact that affects internal, organismic states of the individual. The organism is represented by the processes that mediate the relationships between the stimulus and the individual's responses. The response signifies the final consequence such as customer satisfaction or approach/avoidance behaviour. Barnes and Vidgen (2001) have claimed that website quality can only be measured from the consumer's point of view. DeLone and McLean's (2003) information system (IS) success model conformed to this perspective by separating system quality, information quality, and service quality. This study therefore proposes that from the consumer's viewpoint, the quality of a website can be addressed in terms of these three fundamental factors.

In the online travel agency context, the stimulus is the website quality as it affects the internal states of the customer. Researchers have indicated that website quality include all the cues used to design the website such as the quality of information, system, and service (Ahn et al. 2007; Delone and McLean 2003; Shih 2004). Additionally, Webster et al. (1993) found that perceived playfulness and perceived flow are psychological states which fluctuate with situational contexts and may be influenced by an individual's interaction with a situation. Thus, this study regards perceived playfulness and perceived flow as organism variables that are influenced by stimuli. Accordingly, this study posited that website quality (stimuli) positively influences customers' perceived playfulness and perceived flow (organism), which in turn may affect customers' satisfaction and purchase intention towards an online travel agency (response). Moreover, according to Woszczynski et al.'s (2002) study, the relationships between perceived playfulness and perceived flow were hypothesised to be non-recursive or bidirectional.

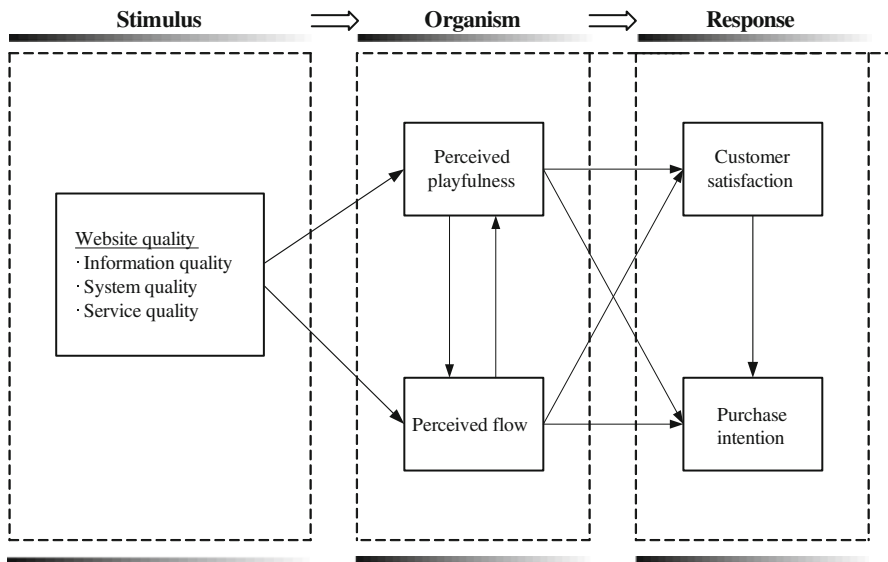


Fig. 1 The conceptual framework

2.2 Stimulus: website quality

Website quality is a vital concept in e-commerce as the customers' perceptions of website quality directly drive their purchase intentions (Bai et al. 2008). Aladwani and Palvia (2002, p. 469) have defined customer's perception of website quality as "users' evaluations of a website's features meeting users' needs and reflecting overall excellence of the website". Thus, when evaluating a company's website offerings, understanding which aspects the website user considers most important has become a priority for companies to employ a successful e-strategy (Hernández et al. 2009). That is, from the services-marketing view to attract and retain customers, online travel agencies need to have a clear knowledge of what online customers expect for the quality that a website should offer (Van Riel et al. 2004).

Numerous prior researchers have presented outstanding methods for measuring website quality by hypothesising about their own dimensions of website quality. Chang and Chen (2008), for instance, used the four dimensions (technical adequacy, content quality, specific content, and appearance) of website quality developed by Aladwani and Palvia (2002) to capture those aspects of a website. Furthermore, Ahn et al. (2007) indicated that the website quality is a multi-dimensional construct comprising information quality, system quality, and service quality. This three-dimensional website quality could be the primary factors to evaluate website users' expectations and perceptions of website quality (Delone and McLean 2003; Liang and Chen 2009). This is consistent with the findings of Hernández et al. (2009) that, based on reviewing website quality related literature from 1992 to 2007, quality of the information, of the system and of the service provided by the firm through its

website are the important factors of commercial website design. According to Lin (2007, pp. 366–368), information quality means a measure of value perceived by a customer of the output produced by a website. System quality means manifest in a website system's overall performance and can be measured by customer perceived degrees of user friendliness in shopping at an online retailer. Service quality signifies overall customer evaluations and judgements about the quality of online service delivery. DeLone and McLean (2003) suggested that this three-dimensional quality factors plays a key role in the satisfaction of online customers, and thus helps improve their purchase intention (Bai et al. 2008). In summary, as stated above, the website quality is used (including information, system, and service quality) in this study as the stimuli.

2.3 Organism: perceived playfulness and perceived flow

Moon and Kim (2001, p. 219) defined perceived playfulness as “the extent to which the individual perceives that his or her attention is focused on the interaction with the World-Wide-Web; is curious during the interaction; and finds the interaction intrinsically enjoyable or interesting”. Moon and Kim (2001) suggested the necessity to introduce perceived playfulness in the context of the World-Wide-Web and they found that it had a significant positive impact on attitude toward using and behavioural intention. Chen et al. (2002) also found perceived playfulness to be a significant factor motivating users to use a virtual store. Furthermore, Nysveen et al. (2005) have studied perceived playfulness in the context of mobile Internet services and found it plays an important role in determining user acceptance of these services. Moon and Kim (2001) stated that playfulness plays a significant role in developing the attitude toward the system and intention to use.

As per the flow theory (Csikszentmihalyi 1988, p. 219), playfulness is considered as an intrinsic belief or motive, which is shaped by the individual's experience with the environment. Flow has been described as a state of optimal psychological experience (Novak et al. 2000) or most enjoyable experience possible when a person is unconsciously engaged in an activity such that she or he becomes so absorbed thereby losing the sense of self (Chung and Tan 2004). Flow experience can usually come from in a variety of activities, such as, hobbies, writing, work, ritual events, sports, artistic performances, and so on. In other words, experiences of concentration, curiosity, and enjoyment in an activity describe the experience of flow (Moon and Kim 2001) and as such perceived playfulness.

Moreover, flow has also been investigated in the context of information technologies and has been regarded as providing useful insight into consumer behaviour (Hsu and Lu 2004; Novak et al. 2000). Research also suggests that the use of World Wide Web can facilitate the occurrence of flow (Chen et al. 1999). Specifically, if the use of the web enables a potential entry into the flow state, i.e. an enjoyable experience, web users should ultimately be able to improve their well-being through accumulated ephemeral moments. In an online context, researchers have theorised that such flow experiences can attract consumers and positively affect subsequent attitude and behaviour (Novak et al. 2000). Accordingly,

researchers have revealed that a flow experience is positively related to consumer attitude towards the focal website, the focal firm (Mathwick and Rigdon 2004) and with the intention to revisit and spend more time at the website (Kabadayi and Gupta 2005). Therefore, the perceived flow is likely to influence subsequent customer satisfaction and purchase intention.

2.4 Response: customer satisfaction and purchase intention

Satisfaction, according to Oliver (1997, p. 13), is the “consumer’s fulfilment response”, and he further defined satisfaction as “the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with a consumer’s prior feelings about the consumer experience”. Anderson and Srinivasan (2003, p. 125) proposed that “satisfaction may be best understood as an ongoing evaluation of the surprise inherent in a product acquisition and/or consumption experience.” Satisfaction is one of the significant consumer outcomes in business-to-consumer online environments (Cheung and Lee 2005). Also, Evanschitzky et al. (2004) proposed that satisfaction as a construct has acquired increased importance in recent times. Specifically, satisfaction is not only the major driver of consumers’ online shopping continuance intention (Bhattacharjee 2001; Lin et al. 2005), but also the key to build and keep a loyal base of long-term customers (Evanschitzky et al. 2004). Numerous studies have shown that satisfaction helps create customer loyalty (Anderson and Srinivasan 2003), enhances positive word of mouth (WOM) (Bhattacharjee 2001), causes repurchase intention (Kim 2010), and improves company market share and profitability (Reichheld and Scheffer 2000). Thus, customer satisfaction is not a new concept and a great many research efforts have been made to understand its antecedents and consequences.

Along with customer satisfaction, it is also important to understand customers’ purchase intention since customers’ behaviour can usually be predicted by their intention. Zeithaml et al. (1996) indicated that purchase intention is one dimension of behavioural intention. To examine consumers’ behavioural patterns, purchase intention has been used to predict actual behaviour due to it is related to actual behaviour (Ajzen and Fishbein 1980) and the link has been empirically investigated in hospitality and tourism businesses (Ajzen and Driver 1992; Buttle and Bok 1996). In addition, a broad body of literature is available on behavioural intentions in offline environments (Zeithaml 2000). As Boulding et al. (1993) indicated, the common behavioural dimensions examined in the literature are purchase/repeat purchase intentions or actual purchase/repeat purchase behaviour; inclination to present WOM, price tolerance, and inclination to make additional purchases from the same source. This study focuses on purchase intention as the crucial outcome variable. During the initial visit to a website, the chief challenge that the service provider faces it to convert the visitor into a buyer. Also, purchase intention directly influences both revenue and profitability of the firm. Therefore, its significance as an outcome variable of interest is clear. Accordingly, customer purchase intention is included as a final dependent variable in our model.

3 Hypotheses development

3.1 The relationships between website quality and perceived playfulness

During online shopping transactions, both consumers and firms communicate and coordinate by exchanging and sharing information through the Internet (Shih 2004). Hence, consumer perceptions of the quality of information on the web are an accurate assessment of perceived information quality. Furthermore, system quality is critical in user beliefs (Hong et al. 2002) and has been used in a number of studies to measure information system performance (Hamilton and Chervany 1981). In an online shopping context, service quality is especially vital because of the lack of face-to-face communication (Ahn et al. 2004). This construct is also crucial to the success of e-commerce information system (DeLone and McLean 2003). In addition, service quality is also likely to play a crucial role in online retailing as it is able to provide all the services (e.g. finding, ordering, and delivering the products) in the purchasing process (Ahn et al. 2007). Chung and Tan (2004) deemed that perceived service quality which encompasses the service attributes is important on user's perceived playfulness. Ahn et al. (2007) found that website quality, categorised into system, information, and service quality, had a significant impact on the perceived playfulness, and consequently, that it encouraged website use in the context of online retailing. The hypotheses thus are developed as follows:

H1a Information quality has a positive effect on online customer perceived playfulness.

H1b System quality has a positive effect on online customer perceived playfulness.

H1c Service quality has a positive effect on online customer perceived playfulness.

3.2 The relationships between website quality and perceived flow

Chau et al. (2000) proposed that information presented on the Internet has a significant impact on the user experience. Zhou et al. (2010) showed that information quality has a significant effect on users' flow experience, which in turn, determines their loyalty. Furthermore, since the online experience is different from that of a more conventional, physical sales experience, the lack of physical content entails compensation with system quality (Mckinney et al. 2002). System quality is significant (Hsu and Lu 2004) and signifies the existence of a fast, reliable connection for navigating a website. Zhou et al. (2010) also showed that system quality has a significant impact on users' flow experience, which in turn, influences their loyalty. Additionally, without efficient system quality, provision of service quality is difficult which in turn diminishes online customer shopping experiences including flow (Aladwani and Palvia 2002). Thus, this study believes that positive perceptions of these specific e-service quality attributes delivered to the consumers

will engage their flow experience and enable them to immerse themselves in the website. As such, in order for consumers to achieve flow experience within the online context, positive perceptions of these three attributes (i.e. information, system, and service quality) must be delivered by the online travel agency to enable the consumers to be immersed and engaged with a website to achieve flow experience. The hypotheses thus are developed as follows:

H2a Information quality has a positive effect on online customer perceived flow.

H2b System quality has a positive effect on online customer perceived flow.

H2c Service quality has a positive effect on online customer perceived flow.

3.3 The relationships between perceived playfulness and perceived flow

The relationship is recursive when causal effect is characterised by uni-directional and that there are no disturbance links between endogenous variables with direct effects between them. However, such hypothesised relationship is very restrictive (Kline 2005). For example, as proposed by Chang and Chen (2008), numerous causal processes are relied on cycles of mutual influence, namely, feedback. The existence of a feedback loop in a structural model automatically makes it reciprocal. Csikszentmihalyi (1975) has suggested that those individuals who experience flow will be likely to continue their activities, simply for the pure enjoyment they experience. This study argues that those individuals who experience flow will be motivated to display the behaviour that led them to the flow state initially, thus showing the playful behaviours repeatedly. Further, the playful behaviours exhibited will be self-reinforcing because the individuals will continue to experience flow as they playfully engage in computer interactions. Woszczynski et al. (2002) indicated that there is positive relationship between flow experience and playfulness, whereas in contrast, Novak et al. (2000) showed that playfulness has a positive relationship with flow. Hence, the following hypotheses are constructed:

H3 The relationships between perceived playfulness and perceived flow are non-recursive.

H3a Perceived playfulness positively affects perceived flow towards an online travel agency.

H3b Perceived flow positively affects perceived playfulness towards an online travel agency.

3.4 The relationships between perceived playfulness, customer satisfaction, and purchase intention

Ahn et al. (2007) proposed that a satisfied customer not only comes from an extrinsic reward of purchasing products or services but also from personal and emotional reward from purchasing-derived pleasure. They also showed that playfulness is positively related to attitude toward use of online retailing and

intention to use online retailing. Sandelands et al. (1983) confirmed that attitudinal outcome such as satisfaction stemmed from playful experience. As indicated by Wozczynski et al. (2002), user satisfaction is a consequence of the playful experience. Webster et al. (1993) mentioned that higher playfulness leads to immediate subjective experience such as satisfaction. Lin et al. (2005), in a study of continued use of a website, confirmed that playfulness is positively associated with satisfaction. Embedding playful attributes within the website not only distinguishes a site from others, but also improves the user's perceived level of satisfaction (Eighmey 1997). Accordingly, the hypothesis is made as following:

H4 Perceived playfulness is positively related to customer satisfaction towards an online travel agency.

Individuals using a website and experiencing playfulness are more absorbed and interested in the interaction, and shape their intention to visit this portal again later (Lin et al. 2005). Davis et al. (1992) verified that perceived playfulness explained significant variance in usage intentions. Lin et al. (2005) showed that perceived playfulness of web portal use is positively associated with their continuance intention. Ahn et al. (2007) showed that Internet shoppers were more likely to use Internet-based retailing when they felt more playful. Accordingly, the hypothesis is made as following:

H5 Perceived playfulness is positively related to purchase intention towards an online travel agency.

3.5 The relationships between perceived flow, customer satisfaction, and purchase intention

Applying the notion of flow, Webster et al. (1993) have shown that perceived flow will increase learning and changes in attitudes and behaviours in computer mediated environments. In an online context, researchers have theorised that such positive flow experiences can attract consumers, mitigate price sensitivity, and positively influence subsequent attitudes and behaviours (Novak et al. 2000). Specifically, researchers have shown that a compelling flow experience is positively associated with consumer attitudes toward the focal website and the focal firm (Mathwick and Rigdon 2004) as well as being positively associated with the intention to revisit and spend more time at the website (Kabadayi and Gupta 2005). O'Cass and Carlson (2010) confirmed that flow experience will increase positive consumer perceptions towards the website, and lead directly to consumer satisfaction. Several previous studies have also presented a strong relationship between online perceived flow and subsequent online behaviours (Chen et al. 1999; O'Cass and Carlson 2010). Cyr et al. (2005) suggested that customers who perceived flow while shopping online would be likely to consider return visits to the website or purchasing from it in the future. Therefore, consumers who perceived flow while shopping online would be likely to generate transaction intentions (Wu and Chang 2005). Based on the above discussion, the hypotheses are made as following:

H6 Perceived flow positively affects customer satisfaction towards an online travel agency.

H7 Perceived flow positively affects purchase intention towards an online travel agency.

3.6 The relationship between customer satisfaction and purchase intention

Westbrook (1981) depicts satisfaction is an emotional status that happens in response to an evaluation of customer-agent mutual interaction experiences. Customer satisfaction relies directly on managing and monitoring individual service encounters, namely the periods of direct customer interaction with a service (Lin and Ding 2006). A practicing business concept requires the pursuit of customer satisfaction as the main goal of any organization (Lin and Ding 2005). As indicated by Gopalakishna and Mummalaneni (1993), customer satisfaction legitimately can be not only an end in itself for travel agents, but it is even deemed a means to such ends as competitive advantages, customer purchase intention, and eventually survival.

Online purchase intention is the strength of a consumer's intentions to perform a specified purchasing behaviour via Internet. Empirical evidence has stated for a positive linkage between customer satisfaction and online purchase intention. Restated, online customers who have received a satisfactory services are likely to reveal positive behavioural intention (Zeithaml et al. 1996), leading to increased online purchase intention.

Previous research on the relationship between website satisfaction and subsequent behavioural and attitudinal outcomes has found that overall satisfaction with online service encounters led to customer loyalty towards the service provider (Anderson and Srinivasan 2003). Yen and Gwinner (2003) found that overall satisfaction with Internet self-service technologies had a positive impact on behavioural intentions, specifically, on willingness to continue purchasing from the same service provider. Investigating outcomes of satisfaction, Shankar et al. (2003) found that overall satisfaction with online service encounters, which reflects a positive attitudinal disposition, led to loyalty towards the service provider. Purchase intent is a key loyalty dimension, and it is therefore likely that satisfaction with a website will increase the likelihood of purchase. Bai et al. (2008) showed that customer satisfaction with website has a positive impact on purchase intentions. Based on the foregoing discussion, the hypothesis is made as following:

H8 Customer satisfaction is positively associated with purchase intention towards an online travel agency.

4 Research methodology

4.1 Study sample and data collection

The travel agencies of Taiwan taking as the research target of this study have two reasons as follows. First, within the context of Internet diffusion, Taiwan represents

a nation at the forefront of technology and economic growth (Bennett and Lai 2005). According to a report by Central Intelligence Agency Factbook of US, the number of Internet users in Taiwan exceeded 14 million people and was ranked twentieth of 218 countries of the world in 2009 and is expected to be ranked higher in the future. Second, in a survey of 438 travel agencies and personnel in-depth interviews, Bennett and Lai (2005) found that travel agencies in Taiwan generally regard the Internet as an effective tool for their business. In the year of 2010, the Institute for Information Industry of Taiwan has reported that travel website is the biggest industry which occupied about 50% B2C e-commerce market in Taiwan. Therefore, it is suitable that this article takes travel agencies of Taiwan as its focus to explore the research questions as discussed earlier.

The study sample included respondents who had visited any travel websites in the last 12 months. A survey instrument was designed to ask respondents if and how their online purchase intention might be indirectly affected by travel website quality and directly affected by their perception of playfulness and flow and experiential satisfaction with travel websites. Data were collected by conducting a web-based survey to maintain respondents' anonymity and overcome time and place constraints, thus helping our study to contact respondents more easily than with other survey methods such as personal and telephone interview and other self-administered survey techniques (Wang and Emurian 2005; Wilde et al. 2004), between June 15 and July 15 of 2010 (about 1 month). Additionally, the message was also subsequently repeatedly posted on various online discussions boards to encourage more responses. The respondents were volunteers who were also interested in the research topic. A total of 558 responses were received. After eliminating duplicate responses, a total of 534 usable responses were included in the sample for analysis. Descriptive statistics was applied to provide the profile of the respondents. The structural equation modelling (SEM) was also used to examine the hypothesised relationships among the constructs in this study.

4.2 Measurement development

The measurement scales displayed in “Appendix” were adapted from the existing literature and were used to operationalise research constructs in this study. Information quality and system quality were measured using four and five items respectively, adapted from Wixom and Todd (2005). Service quality was measured using five items, which were adapted from Jayawardhena (2004). Perceived playfulness was measured by three items, which were adapted from Moon and Kim (2001). Perceived flow was measured by three items, which were developed by Novak et al. (2003). Customer satisfaction was measured by three items, which were adapted from Wixom and Todd (2005). Purchase intention was measured by three items, which were developed by Chen and Barnes (2007). Each item was measured on a seven-point Likert scale (i.e. 1 = disagree strongly; 7 = agree strongly).

5 Non-recursive model

The recursive structural model presumes that all causal effects are characterised by uni-directional and that there are no disturbance relationships between endogenous variables with direct effects between them. Owing to these hypotheses are very limiting (Kline 2005), Chang and Chen (2008) proposed that a lot of causal processes are based on cycles of mutual influence, namely, feedback, and the occurrence of a feedback loop in a structural model automatically makes it reciprocal. Non-recursive structural equation model includes reciprocal feedback loops between variables. In the data-analytic area, numerous previous studies discussed the mechanics of the statistical solution to such models (e.g. Kline 2005; Martens and Haase 2006; Wong and Law 1999). To test a reciprocal causal relationship between perceived playfulness and perceived flow and to confirm the proposed framework, this study used a non-recursive structural equation model, as recommended by Martens and Haase (2006) and Wong and Law (1999).

6 Data analysis and results

This study used LISREL 8.54 to test the relationships hypothesised and used SPSS 12.0 to analyse the data which include descriptive statistics, reliability, and validity.

6.1 Profile of the respondents

Of these 534 questionnaires, 42.9% of the responses were from male respondents, while 57.1% were from females. The respondents of ages 18–44 (83.3%) accounted for the biggest portion of the sample. More than 88.4% of the respondents' education was at college level or above. Most of the participants have Internet experience more than 8 years (51.3%) with use Internet more than 11 h in a week (37.8%). Of the respondents, 34.9% were unemployment (e.g. student, retired, housewife), 23.6% were business, followed by manufacturing (22.1%) and so on. The detailed demographic profile is shown in Table 1.

6.2 Reliability and validity analysis

To analyse the internal consistency of the constructs, the Cronbach's α was calculated and its reliability was investigated. As shown in "Appendix", reliability coefficients exceeded the 0.7 cut-off value as recommended by Nunnally (1978). Therefore, all constructs in this study demonstrated acceptable reliability. Furthermore, to evaluate the convergent validity of the measurements, this study used three measures proposed by Fornell and Larcker (1981), including the item reliability of each measure, the composite reliability of each construct and the average variance extracted for each construct (as shown in Table 2). The item reliability of each measure was evaluated using the factor loading of the underlying construct (Shih 2004). The results indicated that the factor loadings of all measures of the underlying constructs exceed 0.5 and thus conform to the test of item reliability (Hair et al. 1995). Also, the results showed that the

Table 1 Profile of the respondents ($n = 534$)

Variables	Frequency(s)	Percentage of total (%)
Gender		
Male	229	42.9
Female	305	57.1
Age		
18–24	145	27.2
25–34	186	34.8
35–44	114	21.3
45–54	58	10.9
55 and over	31	5.8
Education level		
High school or below	62	11.6
College	278	52.1
Graduate school or above	194	36.3
Occupation		
Public servants	97	18.2
Manufacturing	118	22.1
Business	126	23.6
Unemployment (e.g. student, retired, housewife)	193	36.1
Degree of Internet experience		
1–3 year	79	14.8
4–7 year	181	33.9
Over 8 year	274	51.3
Hours spending on the Internet in a week		
Under 2 h	33	6.2
2–5 h	154	28.8
6–10 h	145	27.2
Over 11 h	202	37.8

composite reliabilities of all constructs are between 0.83 and 0.90 and thus composite reliability is demonstrated (Fornell and Larcker 1981). In addition, it was found that the average variance extracted from each construct exceeds 0.5, and thus demonstrates convergent validity (Fornell and Larcker 1981). Overall, the convergent validity test indicates that the proposed constructs of the extended model are adequate.

Moreover, discriminant validity was used to evaluate the extent to which constructs differ. If the items in a construct correlated more highly with each other than with items measuring other constructs, the measure was regarded as having discriminant validity. Table 3 displays the squared inter-correlations among the study variables. They represent the shared variance among the variables and do not surpass the square root of average variance explained. Hence, discriminant validity is justified in this study.

Table 2 Reliability and factor loadings

Variables	Factor loading	Composite reliability	Average variance extracted (AVE)
Information quality		0.83	0.55
Information quality 1	0.77		
Information quality 2	0.75		
Information quality 3	0.67		
Information quality 4	0.77		
System quality		0.90	0.64
System quality 1	0.76		
System quality 2	0.82		
System quality 3	0.87		
System quality 4	0.78		
System quality 5	0.78		
Service quality		0.86	0.55
Service quality 1	0.79		
Service quality 2	0.76		
Service quality 3	0.75		
Service quality 4	0.70		
Service quality 5	0.71		
Perceived playfulness		0.86	0.67
Perceived playfulness 1	0.83		
Perceived playfulness 2	0.85		
Perceived playfulness 3	0.77		
Perceived flow		0.88	0.72
Perceived flow 1	0.82		
Perceived flow 2	0.86		
Perceived flow 3	0.86		
Customer satisfaction		0.86	0.67
Customer satisfaction 1	0.81		
Customer satisfaction 2	0.86		
Customer satisfaction 3	0.79		
Purchase intention		0.87	0.69
Purchase intention 1	0.86		
Purchase intention 2	0.90		
Purchase intention 3	0.73		

6.3 The structural equation model

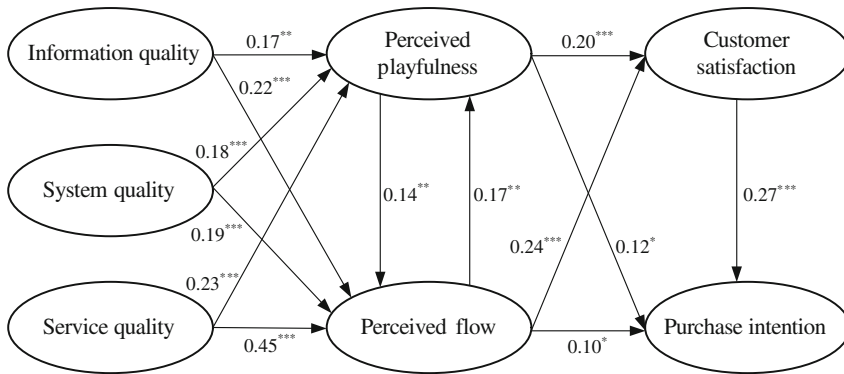
Using structural equation modelling, the hypothesised relationships in the proposed research model were tested and analysed. As seen in Fig. 2, the structural model yielded a Chi-square value of 829.09 with 284 degrees of freedom ($p < 0.001$). The ratio of the Chi-square to the degrees of freedom was 2.92, which was smaller than the recommended level of 5 (Bagozzi and Yi 1988). A comparison of all fit indices, with their corresponding recommended values (Bagozzi and Yi 1988), indicated a good

Table 3 Squared intercorrelation among the constructs

		1	2	3	4	5	6	7
1	Information quality	0.74						
2	System quality	0.04	0.80					
3	Service quality	0.08	0.02	0.74				
4	Perceived playfulness	0.07	0.07	0.12	0.82			
5	Perceived flow	0.11	0.06	0.24	0.15	0.85		
6	Customer satisfaction	0.12	0.04	0.04	0.06	0.06	0.82	
7	Purchase intention	0.03	0.10	0.06	0.05	0.04	0.13	0.83

All correlations are significant at the 0.01 level

The diagonals represent the square root of average variance extracted



Notes: ***($p < 0.001$); **($p < 0.01$); *($p < 0.05$).

χ^2 : 829.09; df: 284; GFI: 0.89; AGFI: 0.87; CFI: 0.96; NFI: 0.94; NNFI: 0.95; IFI: 0.96; RMSEA: 0.060.

Fig. 2 Results of structural modelling analysis

model fit (GFI = 0.89, AGFI = 0.87, CFI = 0.96, NFI = 0.94, RMSEA = 0.06), although the GFI value of 0.89 was at a marginal acceptance level (Etezadi-Amoli and Farhoomand, 1996). The non-recursive model thus satisfies the conditions of both order and rank (Kline 2005; Martens and Haase 2006). Figure 2 shows the structural model estimates, where the estimate parameters are standardised path coefficients and where all path coefficients are significant at the 95% level.

As displayed in Fig. 2, the analytical results indicate that information and system quality of technical-oriented perspective are positively associated with perceived playfulness and perceived flow, thus H1a, H1b, H2a and H2b are supported. Furthermore, the service quality of customer-oriented perspective is positively related to customers' perceived playfulness and perceived flow, providing support for H1c and H2c. Regarding the H3, the relationships between customers' perceived playfulness and perceived flow are non-recursive. Customers' perceived playfulness towards a specific travel agency website significantly and positively affects perceived flow towards the travel agency. Similarly, perceived flow significantly

positively affects customers' perceived playfulness. Thus, H3a and H3b are supported. Furthermore, customers' perceived playfulness and perceived flow positively affect their satisfaction and purchase intention towards a specific travel agency website, providing support for H4, H5, H6 and H7. The positive and significant relationship between customer satisfaction and purchase intention is also demonstrated in this study, providing support for H8.

7 Discussion

The results of this study provide support for the research framework presented in Fig. 1 and for the hypotheses regarding the directional linkages among the model variables. The analytical results demonstrate that perceptions of website quality (i.e. information, system, and service quality) affect customers' perceived playfulness and perceived flow, and in turn, their satisfaction and purchase intention. Moreover, the results reveal that the relationships between perceived playfulness and perceived flow are non-recursive. The relationships among the research constructs are discussed below.

Firstly, this study confirms that website quality contributes customers' perceived playfulness and perceived flow, and in turn, would influence their satisfaction and purchase intention. As shown in Table 4, the total effects of information quality on customers' perceived playfulness, perceived flow, satisfaction, and purchase intention are 0.211, 0.249, 0.102 and 0.078, respectively. The total effects of system quality on customers' perceived playfulness, perceived flow, satisfaction, and purchase intention are 0.217, 0.220, 0.104 and 0.074, respectively. Additionally, the total effects of service quality on customers' perceived playfulness, perceived flow, satisfaction, and purchase intention are 0.311, 0.439, 0.181 and 0.136, respectively. These results show that service quality exerts a stronger effect on customers' decision making than information and system quality, implying that an excellent service quality may prove to be valuable in inspiring high perceived playfulness and perceived flow in customers and increasing their satisfaction and purchase intention. For example, the relationships among service quality, perceived playfulness, perceived flow, customer satisfaction, and purchase intention indicate that customers who are aware with excellent service quality are more likely to perceive playfulness and flow, and in turn more likely to feel satisfied and purchase from a specific online travel agency. Thus, it is essential to provide well-perceived service quality, satisfy their customers, and enhance purchase intention towards a specific online travel agency.

Furthermore, the results also prove that perceived playfulness and perceived flow towards a travel agency website mediate the website quality with regard to customer satisfaction and purchase intention. Note that the reciprocal path coefficient between perceived playfulness and perceived flow are of the same sign (0.14 and 0.17). The analysis suggests that the non-recursive model is reasonable in the sense that the reciprocal paths are not equal and that both are significantly different from 0. The non-recursive analysis of these data gives a moderately unambiguous explanation—there is evidence within these data that the relationships between perceived playfulness and perceived flow are reciprocal in nature. As customers'

Table 4 Direct, indirect and total effects—estimates

Predictor/Dependent	Information quality	System quality	Service quality	Perceived playfulness	Perceived flow	Customer satisfaction
Direct effects						
Perceived playfulness	0.170	0.180	0.230	–	0.170	–
Perceived flow	0.220	0.190	0.450	0.140	–	–
Customer satisfaction	–	–	–	0.200	0.240	–
Purchase intention	–	–	–	0.120	0.100	0.270
Indirect effects						
Perceived playfulness	0.041	0.037	0.081	0.024	0.004	–
Perceived flow	0.029	0.030	0.043	0.003	0.024	–
Customer satisfaction	0.102	0.104	0.181	0.033	0.041	–
Purchase intention	0.078	0.074	0.136	0.027	0.099	–
Total effects						
Perceived playfulness	0.211	0.217	0.311	0.024	0.170	–
Perceived flow	0.249	0.220	0.493	0.143	0.240	–
Customer satisfaction	0.102	0.104	0.181	0.233	0.281	–
Purchase intention	0.078	0.074	0.136	0.147	0.199	0.270

Standardised estimates are shown. All non-zero effects are significant at $p < 0.05$

perceived flow increases because of increasing perceived playfulness, further increase in perceived playfulness will follow. This cycle would be repeated all over the feedback loop until damping down. The analysis results suggest that the causal influence between perceived playfulness and perceived flow is bi-directional and reciprocal. This finding offers a new insight into the relationship between perceived playfulness and perceived flow is reciprocal. Perceived flow can change as the development and design of a website and thus has different levels under different conditions. This study shows that the perceived level of playfulness changes with the variations of perceived flow and vice versa.

8 Conclusions and implications

The results of this study elucidate some important issues concerning the impact of website quality on customer satisfaction and purchase intention which is mediated by perceived playfulness and perceived flow that have not been addressed by previous studies. First, although previous research has focused on website quality (Eroglu et al. 2001, 2003; Ethier et al. 2006), notably, this study further found that service quality is a more influential factor than system and information quality in the context of online shopping, implying that providing the excellent service quality is more important than emphasising the offer of information and system quality in the context of online travel shopping. This finding is particularly important for managers of online travel agency as they decide how to allocate resources. Additionally, e-commerce poses special challenges for businesses, as it makes it

more difficult for them to maintain proprietary services, and switching costs in e-commerce are likely to lower those of traditional business (Yang et al. 2006). Therefore, the offer of superior service quality is an even more critical success factor in online travel agency context.

This study suggests that online travel agencies should consider focusing more of their energy on providing excellent service quality. In general, a travel agency that has both online and offline presences has some advantages, since the offer of superior service quality for the travel agency's online store can be transferred to the travel agency's physical store. Thus, managers of travel agency should leverage the offer of website service quality to generate favourable feeling. That is, customers with perceived playfulness and perceived flow towards a specific travel agency's online store will tend to make a purchase decision even if the offer of service quality of travel agency's physical store is not superior to that of other travel agencies' physical stores.

Furthermore, the analytical result shows that the total effects of information quality on perceived playfulness and perceived flow are 0.211 and 0.249, respectively. Also, the total effects of system quality on perceived playfulness and perceived flow are 0.217 and 0.220, respectively. Additionally, the total effects of service quality on perceived playfulness and perceived flow is 0.311 and 0.493, respectively. These results show that perceived playfulness and perceived flow could well capture the effect of website quality. Therefore, this study suggests that future research could consider using perceived playfulness and perceived flow as organism variables in the stimulus-organism-response research framework.

Finally, this study represents the empirical examination of the reciprocal causal links between the constructs of customers' perceived playfulness and perceived flow, with most previous research having considered the relationships between them to be uni-directional. Although non-recursive structural equation models are far less well known and far less frequently used than recursive mediated models, non-recursive structural equation models represent processes that appear frequently in psychological theory (Martens and Haase 2006). This study shows that the causal influence between customers' perceived playfulness and perceived flow is bi-directional and reciprocal, which contributes to providing empirical support for the hypothesised non-recursive relation of perceived playfulness and perceived flow in the context of an online environment.

9 Limitations and directions for future research

This study has made our best efforts to minimise limitations in the study, but some still need to be addressed. Firstly, as was stated in the literature review section, website quality is a multi-faceted concept. This study used three dimensions—information, system, and service quality—to measure website quality. However, there are still numerous competing concepts concerning the measurement of website quality. Further studies using other dimensional measures may be needed to verify the research model. Secondly, flow is a multifaceted concept. However, this study only adopted a three-item scale to measure the perceived flow. Further studies can

pay even closer attention to this concept. Finally, because frequent website visitors and infrequent website visitors are significantly different, further studies can note and distinguish between their perceptions regarding website quality, perceived playfulness, and perceived flow as linked to satisfaction and purchase intentions.

Appendix

See Table 5.

Table 5 Measurement items

Information quality (reliability $\alpha = 0.76$)
IQ1. The travel agency's website produces the most current information.
IQ2. The travel agency's website provides me with all the information I need.
IQ3. The information provided by the travel agency's website is accurate.
IQ4. In general, the travel agency's website provides me with high-quality information.
System quality (reliability $\alpha = 0.88$)
SQ1. The travel agency's website enables me to get on to it quickly.
SQ2. The travel agency's website performs reliably.
SQ3. The travel agency's website can be adapted to meet a variety of needs.
SQ4. In terms of system quality, I would rate the travel agency's website highly.
SQ5. The travel agency's website makes it easy to get anywhere on the site.
Service quality (reliability $\alpha = 0.85$)
SVQ1. The travel agency's website is prompt in responding to my queries.
SVQ2. I can speak with a representative at the travel agency's website in case I have problems with my account.
SVQ3. When I access my account I feel secure, the travel agency's website instills confidence.
SVQ4. The travel agency's website understands the needs of their customers.
SVQ5. The travel agency's website delivers the service exactly as promised.
Perceived playfulness (reliability $\alpha = 0.82$)
PP1. When interacting with the web portal, I am not aware of the time as it elapses.
PP2. When interacting with the web portal, I am not aware of distracting noise.
PP3. When interacting with the web portal, I often forget other commitments.
Perceived flow (reliability $\alpha = 0.90$)
PF1. When I was browsing in the travel agency's website, I felt totally captivated.
PF2. When I was navigating the travel agency's website, time seemed to pass very quickly.
PF3. When I visited the travel agency's website, nothing seemed to matter to me.
Customer satisfaction (reliability $\alpha = 0.81$)
CS1. I am very satisfied with the information I receive from the travel agency's website.
CS2. I have a positive attitude toward the travel agency's website surfing.
CS3. My interaction with the travel agency's website is very satisfying.
Purchase intention (reliability $\alpha = 0.82$)
PI1. It is likely that I will transact with this travel agency's website in the near future.
PI2. Given the chance, I intend to use this travel agency's website.
PI3. Given the chance, I predict that I should use this travel agency's website in the near future.

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