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STUDY OF FACTORS INFLUENCING MOBILE TICKETING ADOPTION: STATUS QUO BIAS PERSPECTIVE

Qun Zhao[1,2], Chun-Der Chen[2], Jin-Long Wang[3], and Kuang-Ju Wang[2]

Key words: status quo bias theory, mobile ticketing, perceived value, adoption intention.

ABSTRACT

The purpose of this study is to employ the status quo bias theory to determine the key factors behind the adoption of mobile ticketing by mobile users. Using a survey of 241 mobile ticketing users, structural equation modelling is applied to analyze the validity and reliability of the results. We find that perceived value, self-efficacy, and system support are the most important predictors of switching to mobile ticketing, with perceived value the dominant effect. Hence, it is important to emphasize the benefits of mobile ticketing to increase the perceived value to potential users. Furthermore, a seamless mobile ticketing system with a user-friendly interface and simple processes is necessary to enhance user confidence and alleviate switching barriers. Finally, the theoretical and practical implications of this study are discussed.

I. INTRODUCTION

Mobile ticketing represents a new and increasingly popular mobile application trend in m-commerce. According to a Juniper Research report titled "Mobile Ticketing Strategies: Air, Rail, Metro, Sports and Entertainment 2013-2018," the number of digital event and transportation tickets delivered to mobile devices will triple to 16 billion per year by 2018 (Juniper Research, 2013). In particular, application-based alternatives that capitalize on the increased adoption of smartphones will gain greater traction (Mobile News, 2013). Previous studies have indicated that mobile ticketing is an attractive application as it provides greater flexibility, accessibility, and efficiency (Mallat et al., 2009; Alfawaer et al., 2011; Zhou, 2011). For instance, Cheng and Huang (2013) indicated that high-speed railway passengers in Taiwan use mobile devices to obtain ticketing information, purchase tickets, and receive quick response (QR) codes; these QR codes are used to pass through the gates to the platform area in an efficient manner. Moreover, mobile ticketing has been extended to other fields (e.g., sports, theaters, concerts, and other live shows). Alfawaer et al. (2011) introduced a mobile ticketing system for Amman International Stadium. Purchasing conventional paper-based tickets is a time-consuming process because of the large number of people in the queues, long wait times, and complicated selection process for match times and seating. With the help of mobile ticketing platforms, spectators can use mobile devices to access the Internet, purchase electronic tickets, and validate the tickets by scanning a QR code. Therefore, mobile ticketing provides an easy and convenient way for customers to order, pay for, obtain, and validate tickets at any time and place using mobile devices.

Nevertheless, the implementation and acceptance of mobile ticketing is not as widespread as expected. Kim and Kankanhalli (2009) suggested that user resistance to new technology is one cause of these failures. This study aims to elucidate the key factors that influence the adoption of mobile ticketing from the perspective of mobile users. As a theoretical foundation for user information technology/information system (IT/IS) acceptance, previous studies have primarily used the technology acceptance model (TAM) (Carolina et al., 2008; Mallat et al., 2009; Cheng and Huang, 2013), theory of planned behavior (TPB) (Pavlou and Fygenson, 2006), or unified theory of acceptance and usage of technology (UTAUT) (Venkatesh et al., 2012). However, few studies have employed the status quo bias theory (SQBT) (Samuelson and Zeckhuser, 1988) to discuss user acceptance of new technology. Moreover, Wang and Wang (2010) argued that TAM, TPB, and UTAUT have a limited ability to explain the adoption of new information and communication technologies. Hence, this study not only extends the IT/IS acceptance literature, but is also one of the first studies to employ SQBT to provide an insight into mobile user adoption intention (UAI) with regard to mobile ticketing.

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The remainder of this paper is organized as follows. In the next section, we review the relevant theoretical foundations from previous studies, and present the research model and its hypotheses. The third section details the research method used to test the proposed model. An analysis of the results of this study is presented in the fourth section, followed by a discussion of our research findings. Finally, we conclude by mentioning the limitations of this study and identifying potential topics for future research.

II. CONCEPTUAL BACKGROUND AND HYPOTHESES

1. Mobile Ticketing

Mobile ticketing is a process in which customers order, pay for, obtain, and validate ticket at any time and place using mobile phones or other mobile devices. The electronic format of mobile ticketing reduces ticket production and distribution costs (e.g., QR codes, near-field communication, text or picture messaging). The tickets are electronically sent to customers and can be stored on mobile devices, thereby providing a simple, convenient ticketing process. For example, Tai et al. (2013) introduced the Accupass mobile ticketing platform, which offers a selection of events in Taiwan and facilitates ticket purchasing for these events via mobile devices. Accupass enables users to quickly complete their ticket inquiry, purchasing, payment, delivery, and validation through a QR code. When users encounter an event they are interested in—such as one advertised on a poster in a mass rapid transit station—they can use an app to scan the QR code on the poster and obtain specific information about the event. Tickets can then be purchased and certified with a "paid QR code." The customers then use this paid code to attend the show.

2. The Status Quo Bias Theory

Samuelson and Zeckhuser (1988) developed the SQBT in an attempt to explain people's resistance to a new state. The explanations for status quo bias can be categorized as follows: rational decision making, cognitive misperceptions, and psychological commitment. Rational decision making indicates an assessment of the relative costs and benefits of change before making a switch to a new alternative. When the costs of switching exceed the benefits, people prefer to maintain the status quo. Second, cognitive misperception refers to the psychological principle in which loss is considered greater than the equivalent gain in, leading to loss aversion. Third, psychological commitment may be a contributing factor to the status quo bias. This factor consists of three parts: sunk costs, social norms, and efforts to feel in control. Sunk costs refer to commitments that have already been made, which leads to unwillingness to switch to a new alternative. Social norms refer to the prevailing environment, which may reinforce or deter someone's status quo bias. Efforts to feel in control derive from people's inclination towards the power to determine their own situation. This desire contributes to status quo bias because people are unwilling to surrender control by adopting an unfamiliar way of working.

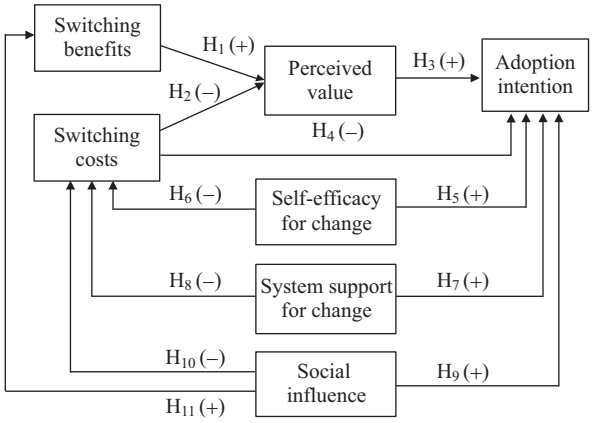


Fig. 1. Framework of the research model.

How does SQBT inform core IT acceptance theories, such as TAM, TPB, and UTAUT? For example, TPB (Ajzen, 1991) focuses on individual perception as the primary driver of acceptance intention and behavior, and seldom discusses other surrounding influence (e.g., social influence) (Bhattacherjee and Sanford, 2006). Similarly, TAM (Davis, 1989) mainly considers the benefits of using a new technology, and rarely accounts for loss factors. Previous studies acknowledge that TAM has rarely been used to examine the interaction of losses and benefits (Torkzadeh and Dhillon, 2002). The shortcomings of TPB and TAM have been partially addressed by UTAUT, which was developed by Venkatesh et al. (2003) and attempts to unify previously identified antecedents of technology acceptance. UTAUT uses performance expectancy, effort expectancy, social influence, and facilitating conditions as antecedents that directly affect behavioral intention (Kim and Kankanhalli, 2009). However, the processes by which users evaluate changes relating to new technology, and which eventually influence UAI, were overlooked.

In this study, we strive to bridge the above gaps in the IT/IS acceptance literature using SQBT. This theory addresses both the benefits and losses that influence mobile UAI, and considers both individual and external factors, such as social influence. It thereby provides a more comprehensive and holistic perspective in evaluating mobile ticketing adoption and determining its effects on the choices made by mobile users.

Fig. 1 illustrates our research model. Following the research of Kim and Kankanhalli (2009), we propose several key constructs. Perceived value is the evaluation of whether the benefits outweigh the costs incurred when deviating from the status quo (Kim and Kankanhalli, 2009). Perceived value, as well as switching benefits and switching costs, are classified as rational decision making in SQBT. Self-efficacy for change and organizational support for change are derived from the idea of psychological commitment (Samuelson and Zeckhuser, 1988), which represents internal and external controls. Herein, we refer to the system support for change, instead of

the organizational support for change concept used by Kim and Kankanhalli (2009), to account for the technical systems involved in mobile ticketing. In our study, social influence is examined in place of colleague opinion, a type of psychological commitment in SQBT. This is because mobile ticketing adoption can involve the broader influence of mass media, online communities, and forums, rather than the narrower consideration of colleagues. Finally, UAI is discussed as a dependent variable, because our objective is to offer suggestions about critical factors that affect the adoption of mobile ticketing from the perspective of mobile users.

3. Switching Benefits, Switching Costs, and Perceived Value

A switching benefit is the perceived utility of switching from the status quo to a new situation. Similarly, a switching cost refers to the perceived disutility a user would incur in switching from the current state to a new situation (Burnham et al., 2003; Kim and Kankanhalli, 2009). Rai et al. (2002) found that switching to a new IS generally produced the benefit of enhanced task performance, whereas Anckar and D'Incau (2002) argued that the benefits of mobile services are particularly noticeable when spontaneous, time-critical, and mobility-based needs arise.

Herein, the switching benefits of mobile ticketing are the previously described advantages of mobile access and the electronic format, which increase the efficiency of the ticketing process (Mallat et al., 2009; Zhang et al., 2012). However, the switch to mobile ticketing could incur costs, such as money required to buy an intelligent mobile device, additional network charges, and the time involved in learning how to use mobile ticketing. According to SQBT, perceived value is described as the perceived net benefit, which stems from the cost-benefit tradeoff. If the switching benefits exceed the switching costs, a positive outcome is gained from using the new approach, and this leads to positive perceived value. The converse results in a negative perceived value. Hence, we propose the following hypotheses:

H_1 ***Switching benefits of using mobile ticketing have a positive effect on perceived value.***

H_2 ***Switching costs of using mobile ticketing have a negative effect on perceived value.***

Prior studies have indicated that perceived value could be a predictor of behavioral intention with regard to Internet retailing (Cheng et al., 2009), mobile value-added services (Chi et al., 2008), e-commerce (Chen and Dubinsky, 2003), and mobile hotel booking (Wang and Wang, 2010). Therefore, we contend that users who perceive a higher value in mobile ticketing will have a stronger tendency to use it (Sirdeshmukh et al., 2002). Thus, we hypothesize the following:

H_3 ***Perceived value of using mobile ticketing has a positive effect on mobile ticketing UAI.***

Many researchers have verified that switching costs are closely related to customer retention rates. For example, Doyle (1986) suggested that uncertainty about a product's quality represents a kind of switching cost; i.e., customers are more likely to maintain their current status. Uncertainty has also been observed to reduce the intention to purchase (Beggs and Klemperer, 1992). In our study, the costs of switching to mobile ticketing include the expense of buying a smart phone, additional Internet charges, and learning costs. Higher switching costs will decrease UAI. Accordingly, we propose the following:

H_4 ***Switching costs of using mobile ticketing negatively affect mobile ticketing UAI.***

Self-efficacy for change is considered an internal factor that can enhance a user's feelings of control. This concept has previously been described as an individual's confidence in their ability to adapt to new situations (Bandura, 1995; Kim and Kankanhalli, 2009). Prior research has suggested that individuals with high levels of self-efficacy are more likely to form positive perceptions of, and will more frequently use, new technology (Venkatesh et al., 2007). When using new technology, users perceive either a challenge to be mastered or a threat to be avoided, depending on their level of self-efficacy (Bandura, 1995). Based on the above, we hypothesize that:

H_5 ***Self-efficacy for change has a positive effect on mobile ticketing UAI.***

Conversely, users with low self-efficacy are more likely to feel anxious and uncertain about change. According to SQBT, switching costs are comprised of transition, uncertainty, and sunk costs (Samuelson and Zeckhauser, 1988). Thus, the switching costs will increase as levels of anxiety and uncertainty rise. Low self-efficacy for change, therefore, implies a higher perception of uncertainty and transition costs. We therefore propose that higher self-efficacy for change may lower user perceptions of switching costs.

H_6 ***Self-efficacy for change negatively affects switching costs.***

Certain external factors also affect the perception of switching costs, such as the perceived effectiveness of an information system for mobile ticketing (Kim and Kankanhalli, 2009). Switching to new mobile applications may require guidance and learning resources (Hirschheim and Newman, 1988), and so providing information about mobile ticketing through customer services, forums, or other mechanisms could foster a positive reaction toward mobile ticketing. Lewis et al. (2003) found that management commitment and support shapes the belief that the technology is useful for work activities and increases ease of use. As support for change increases, user resistance may decrease and UAI for mobile ticketing may increase. Thus, we hypothesize that:

H_7 ***System support for change has a positive effect on mobile ticketing UAI.***

Based on the above, greater system support for change can help to reduce the time and effort required to learn how to use the new technology (Lewis et al., 2003). Therefore, system support for change may increase UAI by lowering the perception of switching costs. Hence, we hypothesize that:

H_8 ***System support for change decreases switching costs.***

Cialdini and Goldstein (2004) posited that social influence relates to being frequently rewarded for behaving in accordance with the attitudes, opinions, and advice of social channels. Social influence is also known as normative pressure or subjective norm (Carolina et al., 2008). This pressure may shape one's confidence in or ability to use a technology. In this context, prospective users of mobile ticketing would presumably agree that adoption is easier if other people have confirmed its ease of use. Accordingly, positive social influence encourages users to try new technology, and therefore enhances the UAI of mobile ticketing. Consequently, we posit that:

H_9 ***Positive social influence has a positive effect on mobile ticketing UAI.***

Kim and Kankanhalli (2009) argued that colleague influence may indirectly foster resistance to new technology. In this context, social influence may also indirectly influence mobile ticketing adoption. Moreover, Burnkrant and Cousineau (1975) indicated that social environments (e.g., attitudes, behaviors, or perceptions of others) can change a user's original perception of switching costs and benefits. Accordingly, others' favorable opinions on mobile ticketing may reduce user uncertainty and lower perceptions of switching costs while enhancing perceptions of switching benefits. Therefore, we hypothesize that:

H_{10} ***Positive social influence decreases the perceived switching costs of mobile ticketing.***

H_{11} ***Positive social influence increases the perceived switching benefits of mobile ticketing.***

III. METHODOLOGY AND RESEARCH DESIGN

1. Sample and Data Collection

To test our hypotheses, data was collected in two rounds in Taiwan. We first employed a web-based format to reach a wider group of mobile ticketing users of different demographics. A survey was posted on Sogi.com, a popular Taiwan-based mobile product site and forum, for eight weeks starting from March 15, 2015. In order to effectively eliminate repeat responses, as suggested by Zhao et al. (2016), we removed responses with duplicate IP addresses from our data sample. In the second round, a paper-based questionnaire was directly sent to participants, including university students, employees, and other mobile users in northern Taiwan. In Taiwan, there were more 126.4 mobile phone subscribers per 100 inhabitants in 2013 (National Communications Commission, 2013). Moreover, mobile applications (e.g., mobile ticketing) have contributed to the average revenue per user (ARPU), which accounted for 22% of ARPU in 2014 in Taiwan (Wang, 2015). Therefore, Taiwan is a suitable context for mobile ticketing research.

Participants were first asked whether they had contributed to the web-based survey. If so, they were instructed not to complete the paper-based survey (Turel et al., 2010). A total of 241 complete and valid questionnaires were obtained (100 web-based, 141 paper-based). A multivariate analysis of variance revealed no significant difference between the two respondent groups based on demographic variables ($p > 0.05$).

The demographic profile of respondents is presented in Appendix A. The sample was slightly male-dominant with 51.9% men. Most respondents were between 21 and 30 years old, who comprise the most potential mobile Internet users in Taiwan (Liao et al., 2007). More than 93% respondents had a college-level education or higher. 62.2% had experience making mobile payments. Approximately 43.6% utilized mobile ticketing at least once per week.

2. Instrument Development

The metrics for each relevant factor were developed by adapting scales from prior studies. For instance, the items measuring perceived value were modified to relate to mobile ticketing from the value constructs used by Sirdeshmukh et al. (2002), Sigala (2006), and Rintamaki et al. (2006). The switching benefit measurement was developed from Moore and Benbasat (1991). To develop the concept of switching costs, we used items from Jones et al. (2002). To measure self-efficacy for change dimensions, we relied on the work of Bandura (1986). Measurement items for system support for change were developed from Thompson (1991). To measure social influence, we adapted scales from Shen et al. (2010). To measure UAI of mobile ticketing, we used items suggested by Fishbein and Ajzen (1975). The sources and standardized loadings of all measurement items are given in Appendix B. Each item was measured on a 5-point Likert-type scale with anchors ranging from "1 = strongly disagree" to "5 = strongly agree".

IV. DATA ANALYSIS AND RESULTS

1. Survey Validity

To validate the survey, we analyzed its convergent and discriminant validity. Convergent validity is evaluated by inspecting the standardized path loading, composite reliability (CR), Cronbach's α, and average variance extracted (AVE) (Gefen et al., 2000). Respecting the criteria recommended by Fornell and Larcker (1981), we evaluated the measurement scales on three criteria: (1) all indicator factor loadings should be significant and exceed 0.5; (2) construct reliabilities should exceed 0.8; and (3) AVE of each construct should exceed the variance due to measurement error for that construct.

We first performed confirmatory factor analysis (CFA) using

Table 1. Reliability, correlation coefficients, and AVE results.

Construct	Cronbach's α	CR	AVE	UAI	PVL	SI	SS	SFC	SWC	SWB
UAI	0.918	0.942	0.804	***0.894***						
PVL	0.912	0.926	0.558	0.794	***0.849***					
SI	0.835	0.887	0.665	0.427	0.418	***0.819***				
SS	0.861	0.915	0.783	0.741	0.687	0.450	***0.883***			
SFC	0.901	0.938	0.835	0.734	0.676	0.280	0.662	***0.917***		
SWC	0.819	0.881	0.653	-0.367	-0.380	0.144	-0.322	-0.465	***0.806***	
SWB	0.908	0.935	0.784	0.718	0.778	0.357	0.676	0.677	-0.369	***0.883***

Notes:

1. The main diagonal shows the square root of the AVE and correlations between different constructs is shown in the lower left off-diagonal elements in the matrix.
2. Significance at $p < 0.01$ level is shown in bold and italics.
3. UAI = User Adoption Intention, PVL = Perceived Value, SI = Social Influence for change, SS = System Support for change, SFC = Self-efficacy for change, SWC = Switching Cost, SWB = Switching Benefit.

Table 2. Summary of 11 hypotheses.

No.	Hypotheses	Supported
H_1: SWB→(+)PVL	Switching benefits of using mobile ticketing have a positive effect on perceived value.	Yes
H_2: SWC→(−)PVL	Switching costs of using mobile ticketing have a negative effect on perceived value.	No
H_3: PV→(+)UAI	Perceived value of using mobile ticketing has a positive effect on mobile ticketing UAI.	Yes
H_4: SWC→(−)UAI	Switching costs of using mobile ticketing negatively affect mobile ticketing UAI.	No
H_5: SFC→(+)UAI	Self-efficacy for change has a positive effect on mobile ticketing UAI.	Yes
H_6: SFC→(−)SWC	Self-efficacy for change negatively affects switching costs.	Yes
H_7: SS→(+)UAI	System support for change has a positive effect on mobile ticketing UAI.	Yes
H_8: SS→(−)SWC	System support for change decreases switching costs.	No
H_9: SI→(+)ITU	Positive social influence has a positive effect on mobile ticketing UAI.	No
H_{10}: SI→(−)SWC	Positive social influence decreases the perceived switching costs of mobile ticketing.	No
H_{11}: SI→(+)SWB	Positive social influence increases the perceived switching benefits of mobile ticketing.	Yes

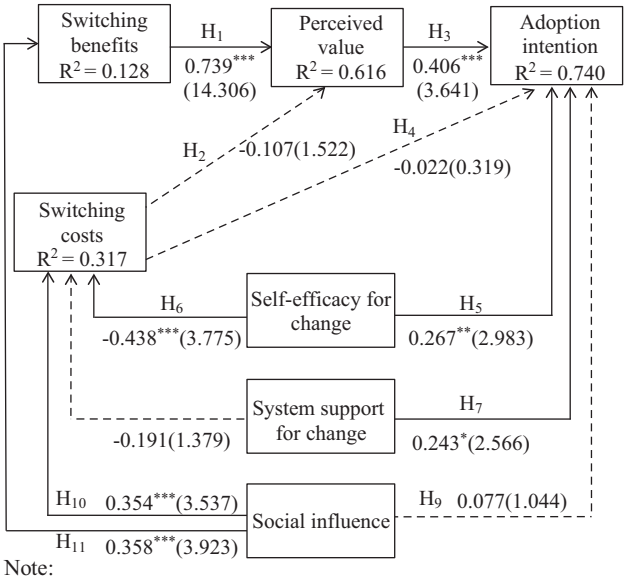
partial least-squares (PLS) and the SmartPLS2.0 software (Chen et al., 2007; Chen and Ku, 2013). As shown in Appendix B, the factor loadings of this study were all significant and greater than 0.5 (Fornell and Larcker, 1981). The CR of the constructs ranged from 0.881-0.942 (Table 1), Cronbach's α exceeded 0.8 for all constructs, and the AVE of each construct was greater than 0.5. Thus, the convergent validity for the constructs was established.

Next, we assessed the measurement model's discriminant validity, which is the degree to which the measures of two constructs are empirically distinct (Chin, 1998). If the square root of each construct's AVE is larger than its correlation with other constructs, the discriminant validity is supported. As shown in Table 1, the highest correlation between any pair of constructs was 0.794, which was between the perceived value (PVL) and UAI. This figure was lower than the lowest square root of the AVE among all constructs, which was 0.806 for switching cost (SWC). Hence, the discriminant validity of the survey was supported.

2. Hypothesis Testing

A bootstrapping technique was used to test the statistical significance of each path coefficient using *t*-tests. The results are shown in Fig. 2. For instance, the switching benefit (H_1) was found to positively and significantly affect perceived value ($\beta = 0.739^{***}$, *t*-value > 3.29); thus, H_1 was supported. Overall, six of eleven hypotheses (H_1, H_3, H_5, H_6, H_7, and H_{11}) were supported. The remaining five hypotheses (H_2, H_4, H_8, H_9, and H_{10}) were not supported. Social influence (H_{10}) positively and significantly affected switching cost ($\beta = 0.354^{***}$, *t*-value > 3.29), which was contrary to our prediction and remains an interesting phenomenon. Table 2 shows a summary of 11 hypotheses.

The explained variance or R^2 value is another important indicator of path model predictive power. The results indicated that the model explained 74% of the variance in UAI ($R^2 = 0.740$). Approximately 62% of the variance in perceived value was explained by switching benefits and costs ($R^2 = 0.616$), with some 13% of switching benefit variance explained by social influence ($R^2 = 0.128$). Moreover, 31.7% of the switching cost variance was explained by self-efficacy for change, system support for change, and social influence.



Note:
1. Solid arrow represents significant hypothesis;
   Dotted arrow representsnon-significant hypothesis
2. Significancelevels: ***p < 0.001; **p < 0.01; *p < 0.05
3. *t*-values for standardized path coefficients are given in parentheses.
   t-value ≧ 1.96*; *t*-value ≧ 2.58**; *t*-value ≧ 3.29***

Fig. 2. Results of path analysis.

V. CONCLUSION AND DISCUSSION OF FINDINGS

This study used SQBT to provide an insight into the factors affecting the adoption of mobile ticketing. The results reveals that perceived value, self-efficacy for change, and system support for change have a direct and significant impact on mobile UAI. However, no evidence indicates that social influence or switching costs have a direct effect on UAI. Our findings have significant implications for the administration of mobile ticketing if companies wish to increase switching intention and alleviate resistance.

Our findings indicate that perceived value is the most important UAI predictor (β = 0.406) for mobile ticketing. This finding is consistent with the results of Wang and Wang (2010) regarding the adoption of mobile hotel reservations. In addition, previous studies have shown that users tend to emphasize value when making the decision to switch to new technology (e.g., mobile ticketing), and are likely to accept change with a higher perceived value (Gupta and Kim, 2010; Kim and Kankanhalli, 2009). Hence, if mobile users perceive a higher value in using mobile ticketing, the UAI of mobile ticketing will be strengthened, which supports hypothesis H_3.

Furthermore, according to prior studies, switching benefits positively increase perceived value (Rai et al., 2002; Kim and Kankanhalli, 2009). In our context, switching benefits and costs jointly explained 61.6% of perceived value, with switching benefits showing positive and significant effects on perceived value. This implies that greater benefits of using mobile ticketing will induce a stronger perceived value in its adoption. As Mallat et al. (2009) found, usefulness and mobility can be summarized as perceived benefits of mobile ticketing. These benefits were verified as having increased the perceived value of mobile ticketing adoption; thus, H_1 was supported.

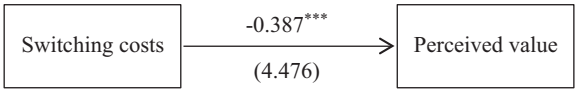
Our study additionally determined that self-efficacy for change increases UAI and decreases switching costs. Kim and Kankanhalli (2009) demonstrated that self-efficacy for change increases both the learning and ease of use of new applications; i.e., users with high self-efficacy for change are more confident and adaptable to new situations (e.g., mobile ticketing). Thus, users with greater self-efficacy for change perceive a lower switching cost in mobile ticketing, which increases UAI. This finding is supported by that of Kwon et al. (2013), who employed TAM to evaluate why customers download hospitality industry mobile applications. They found that confident customers who enjoy using smartphones are more likely to try other mobile applications; accordingly, H_5 was supported.

Additionally, system support for change positively affects UAI. A prior study (Hirschheim and Newman, 1988) indicated that switching to new applications may require guidance and relevant resources for learning. In our context, if mobile ticketing operators provide information resources through customer services, forums, and other channels, the ease of adaptation to mobile ticketing will increase (Samy, 2012). Hence, system support for change will increase UAI. Furthermore, the relationship between social influences and switching benefits is positive and significant, which means that others' positive opinions about mobile ticketing can reduce user uncertainty and increase the perception of switching benefits (Lewis et al., 2003). Thus, H_7 was supported.

Nevertheless, switching costs showed a negative but insignificant effect on perceived value (H_2). This may be because experienced mobile users perceive a lower switching cost, which thus has less influence on perceived value. The participants in our study were experienced mobile users who were likely to already have smartphones with Internet access; thus, they would not have incurred typical switching costs. Moreover, young and well-educated users—who comprised the majority of our respondents—may perceive low switching costs with regard to mobile ticketing adoption. Therefore, the learning cost of switching to mobile ticketing will also be low for these users. Because these participants perceive low or no switching costs, the relationship between switching costs and perceived value was statistically insignificant.

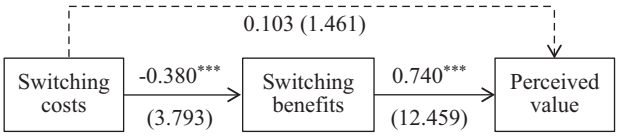
For another, switching costs may not directly affect perceived value. For the mediation analyses of unsupported hypotheses, this study referred to the mediation analysis by Shin et al. (2014) to conduct follow-up analysis and discussion. First, we focused on the direct effect of switching costs on perceived value, and found that switching costs have a negative and significant effect on switching benefits (β = -0.382***, *t*-value > 3.29), as shown in Fig. 3a.

We then conducted a mediation analysis, and determined that the switching costs negatively and significantly affected switching benefits (β = -0.382***, *t*-value > 3.29). Switching



Note:
1. Significance levels: ***p < 0.001; **p < 0.01; *p < 0.05;
2. *t*-values for standardized path coefficients are described in parentheses. *t*-value ≧ 1.96*; *t*-value ≧ 2.58**; *t*-value ≧ 3.29***

Fig. 3a. Direct effects from switching costs to perceived value.



Note:
1. Significance levels: ***p < 0.001; **p < 0.01; *p < 0.05;
2. *t*-values for standardized path coefficients are described in parentheses. *t*-value ≧ 1.96*; *t*-value ≧ 2.58**; *t*-value ≧ 3.29***

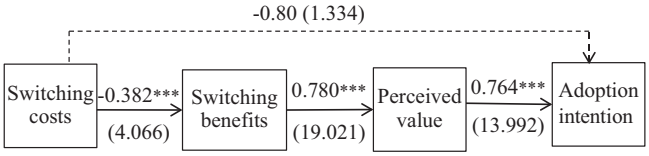
Fig. 3b. Mediation effect of switching benefits.

benefits positively and significantly affect perceived value (β = 0.740***, *t*-value > 3.29). The relationship between switching costs and perceived value was insignificant (β = 0.103, *t*-value < 1.96). Thus, switching benefits were verified to fully mediate the effect of switching costs on perceived value, as shown in Fig. 3b. This relationship may be an additional finding for SQBT, as it was not acknowledged by Kim and Kankanhalli (2009). A possible explanation is that experienced mobile users focus on the benefits rather than costs of mobile ticketing; i.e., switching benefits have a dominant effect on perceived value.

Furthermore, the switching costs had no direct impact on UAI (H_4). This is possibly because experienced mobile ticketing users perceive minimal switching costs. We conducted a mediation analysis, and found that the switching costs influenced UAI through the mediation of switching benefits and perceived value. As shown in Fig. 4, the indirect effect of switching costs on UAI via switching benefits and perceived value was verified.

The system support for change was found to have no effect on switching costs (H_8), which is consistent with previous findings (Kim and Kankanhalli, 2009). Herein, such support included customer services, forums, and other channels to reduce perceived difficulties in adapting to mobile ticketing. With the widespread use of mobile devices and applications, the system support for mobile services is becoming a mature and necessary setting. Thus, mobile users may experience less difficulty in adapting to mobile ticketing, and rarely require further system support. Moreover, the costs of switching from conventional to mobile ticketing are low for individuals. In this regard, system support for change may have no significant influence on switching costs.

Furthermore, social influence for change has no significant



Note:
1. Significance levels: ***p < 0.001; **p < 0.01; *p < 0.05;
2. *t*-values for standardized path coefficients are described in parentheses. *t*-value ≧ 1.96*; *t*-value ≧ 2.58**; *t*-value ≧ 3.29***

Fig. 4. Mediation effects of switching benefits and perceived value.

effect on UAI (H_9). Some possible explanations for this result are as follows. First, social influence is weak in the early stages of mobile ticketing implementation, which aligns with the findings of Bhatacherjee and Sanford (2006). Although mobile phones are widely used, few people have experience with still-nascent mobile ticketing, which is rarely discussed in the media or social networks. Thus, most users independently decide to adopt mobile ticketing without much influence from their surroundings. Second, the impact of social influence on UAI is a controversial issue. Davis et al. (1989) dropped social norms from TAM because there is no empirically significant relationship within a technology acceptance context. Subsequent studies (Venkatesh et al., 2003) using TAM suggested that social influence must exist before new users can be socialized into the given behavior. Studies have also indicated that social influence, especially normative influence, only occurs when virtual community members have a deep affective affiliation with other members (Shen et al., 2010). Finally, in Fig. 2, we can see that social influence indirectly influences UAI through other variables, such as switching benefits and perceived value.

We additionally found that social influence positively and significantly affects switching costs (H_{10}); however, not in the expected direction. Carolina et al. (2008) indicated that social influence could also be regarded as normative pressure, which Lu et al. (2011) defined as pressure from social networks to make a behavioral decision. Thus, if potential adopters decide to use mobile ticketing because of social pressure, they may not mentally accept the decision. This could lead to frustration and higher perceived switching costs. Hence, greater social influence for change may increase the switching costs.

VI. THEORETICAL AND PRACTICAL IMPLICATIONS

For researchers, the academic implications of the present research are threefold. First, a primary contribution of this study to the IT/IS acceptance literature is the introduction of SQBT to the area of mobile ticketing. Previous studies on new technology acceptance have mainly used TAM, TPB, or UTAUT as their theoretical basis. This study, however, is one of the first to employ SQBT to elucidate the factors that

influence user adoption of mobile ticketing. Based on SQBT, this study has conducted an overall change evaluation (e.g., switching cost-benefit analysis) and demonstrated how SQBT can be applied to explain the UAI of mobile ticketing. This is a more holistic view of technology acceptance that considers the overall changes related to mobile ticketing.

Second, extending the research of Kim and Kankanhalli (2009), this study has refined the application of SQBT from organizational information system adoption to mobile ticketing adoption. Our study clearly demonstrates how SQBT is applied, and identifies key factors that influence mobile ticketing adoption. Third, we have demonstrated that switching costs have an indirect effect on perceived value. We found that switching benefits fully mediate the effect of switching costs on perceived value. However, this finding has not been discussed in terms of SQBT (Samuelson and Zeckhauser, 1988), and was not acknowledged by Kim and Kankanhalli (2009). Additional research can further evaluate this relationship in other fields.

For practitioners, our results offer suggestions on enhancing the implementation of mobile ticketing. We have found that perceived value, self-efficacy for change, and system support for change directly and significantly affect mobile UAI, with perceived value dominating the effect. Hence, increasing the perceived value should be the first priority for those wishing to maximize the use of mobile ticketing. We also found that switching benefits are a deterministic factor in explaining perceived value. Thus, greater emphasis should be placed on switching benefits to increase perceived value and further enhance mobile ticketing UAI. In this vein, Mallat et al. (2009) suggested that timely services that can be tailored according to specific user location should be built. Based on accurate real-time positioning, mobile ticketing platforms can connect users and notify them of current ticket information. With numerous location-based services combined with mobile ticketing, it is possible to increase the perceived value of mobile ticketing and further enhance mobile ticketing UAI.

Our study also showed that self-efficacy for change and system support for change are important and influential factors on mobile UAI. Thus, to increase self-efficacy, seamless mobile ticketing should be provided, with a user-friendly interface and simple processes to enhance user confidence and alleviate switching barriers. To enhance system support for mobile users, Hirschheim and Newman (1988) suggested that clear guidance and learning information are very important. Hence, mobile users should be provided with informational resources such as video tutorials, forums, or customer services to help enhance the ease of adapting to mobile ticketing.

VII. LIMITATIONS AND FUTURE RESEARCH

Although this research was carefully designed and conducted, a number of limitations have been identified. First, this study examines the factors influencing mobile ticketing adoption in Taiwan and the results may not be generalized to mobile ticketing users in other countries. Therefore, the moderating effect of culture could be discussed in future studies. Second, our study respondents were experienced mobile ticketing users. With the advance of mobile commerce and wider mobile ticketing implementation, future research could include inexperienced users to enhance the objectivity with which UAI is measured. Third, this study analyzed factors influencing mobile ticketing adoption from the mobile users' perspective, which belongs to the "demand" side. Future research could address the "supply" side from the perspective of mobile ticketing issuers. Company satisfaction with mobile ticketing performance could also be discussed.

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APPENDIX

1. Appendix A.

Demographic profile of respondents (N = 241).

Demographic Variables	Frequency	Percentage
Gender		
Male	125	51.9
Female	116	48.1
Age		
≤ 20	16	6.6
21-30	139	57.7
31-40	36	14.9

Demographic Variables	Frequency	Percentage
41-50	40	16.6
≥ 51	10	4.1
Occupation		
Students	109	45.2
Employed	108	44.8
Unemployed	12	5
Others	12	5
Education		
Junior high school or less	1	0.4
High school	15	6.2
University	108	44.8
Postgraduate degree or more	11	48.5
Monthly income		
≤ US$639 (NT$20,000)	105	43.6
US$640 (NT$20,001)-US$959 (NT$30,000)	30	12.4
US$960 (NT$30,001)-US$1,279 (NT$40,000)	30	12.4
US$1,280 (NT$40,001)-US$1,599 (NT$50,000)	28	11.6
≥ US$1,600 (NT$50,001)	48	20
Time spent on smart phone per day(expect phone call)		
≤ 30 minutes	42	17.4
31-60 minutes	66	27.4
61-90 minutes	33	13.7
≥ 90 minutes	100	41.5
Online payment(use smart phone)		
Yes	150	62.2
No	91	37.8
Frequency of using mobile ticketing per week		
Few/barely	94	39
1	105	43.6
2	21	8.7
3	11	4.6
4	3	1.2
5 or more	7	2.9
Other extra-mobile applications		
Yes	129	53.5
No	112	46.5

2. Appendix B.

Scales and measures.

Construct	Adapted Scale	Scale Source	Standardized loading
Switching benefits	Change to use mobile ticketing would enhance my effectiveness in daily life than the current way.	Moore and Benbastat (1991)	0.925
	Change to use mobile ticketing would enable me to accomplish relevant tasks more quickly than the current way.		0.907

Construct	Adapted Scale	Scale Source	Standardized loading
	Change to use mobile ticketing would increase my mobility in daily life than the current way.		0.872
	Change to use mobile ticketing would improve the quality of my daily life than the current way.		0.837
Switching costs	Change to use mobile ticketing would cost me a lot of time and efforts to learn.	Jones et al. (2000)	0.852
	It would take a lot of time and effort to switch to the new way of using mobile ticketing.		0.897
	Switch to use mobile ticketing could result in unexpected hassles.		0.795
	I would lose a lot in my life if I were to switch to the new way of use mobile ticketing.		0.671
Perceived value	Considering the time and effort that I have to spend, the change to the new way of using mobile ticketing is worthwhile.	Sirdeshmukh et al. (2002)	0.767
	Considering the loss that I incur, the change to the new way of using mobile ticketing is of good value.		0.751
	Considering the hassle that I have to experience, the change to the new way of using mobile ticketing is beneficial to me.		0.781
	The layout and appearance of mobile ticketing make it aesthetically appealing.	Sigala (2006)	0.613
	Using mobile ticketing entertains me.		0.731
	Using mobile ticketing makes me feel good.		0.786
	Using mobile ticketing fits the impression that I want to give to others.	Rintamaki et al. (2006)	0.749
	I am eager to tell my friends/acquaintances how good the mobile ticketing is.		0.782
	I found using mobile ticketing is consistent with my style.		0.782
	Using mobile ticketing is personally important or pleasing for me.		0.714
Self-efficacy for change	Based on my own knowledge, skills and abilities, changing to the new way of using mobile ticketing would be easy for me.	Taylor and Todd (1995)	0.888
	I am able to change to the new way of using mobile ticketing without the help of others.		0.939
	I am able to change to the new way of using mobile ticketing reasonably well on my own.		0.915
System support for change	System support for mobile ticketing provides me guidance on how to change to the new way of using it.	Thompson et al. (1991)	0.819
	System support for mobile ticketing provides the necessary help and resources to enable me to change to the new way of using it.		0.927
	I am given the necessary support and assistance to change to the new way of using mobile ticketing.		0.905
Social influence	I frequently gather information from others or groups about the usage of mobile ticketing before I use it.	Shen et al. (2010)	0.715
	To make sure I will use mobile ticketing properly, I often observe what others or groups are using.		0.831
	I achieve a sense of belonging by changing to use mobile ticketing together with others or groups.		0.877
	What others or groups consider important matters are also important to me.		0.830
Adoption intention	Mobile ticketing is worth using in daily life.	Fishbein and Ajzen (1975)	0.892
	I intend to continue my use of mobile ticketing in the future.		0.932
	I will regularly use mobile ticketing in the future.		0.881
	I will strongly recommend friends or relatives to use mobile ticketing.		0.882

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