

Understand the Role of Trust in the Diffusion of Mobile Payment Service

Completed Research Paper

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Abstracts

In recent years, mobile payment services grow rapidly worldwide. The Taiwanese government also set up the goal to reach 90% coverage for mobile payments by 2025. However, it is still developing slowly in Taiwan. How to promote this new service and increase the acceptance rate is a critical issue in Taiwan. Authors claim that the formation of trust is the critical factor. Therefore, the purpose of this study attempts to understand the formation of trust in mobile payment service diffusion. Based on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the theory of trust transfer, an integrated model to understand the antecedents and consequences of mobile payment trust is constructed. Through questionnaire survey, we have the following three major findings. First, we propose the importance of different four trust targets of mobile payment service. Besides, the antecedents and consequences of mobile payment trust have been identified. Finally, we find the social influence has significant negative impact to mobile payment continuous use intention in Taiwan.

Keywords: Mobile payment service, Trust, Trust transfer, UTAUT 2

Introduction

In recent years, increased promotion of the development of a cashless society has resulted in mobile payments growing rapidly in many countries worldwide. In 2017, the total amount of global mobile transactions reached USD 540 billion, with a 40% annual growth rate (Juniper Research, 2017). The market value of near field communication (NFC) payments, which have become increasingly popular, was close to USD 58 billion in 2017. It is estimated that the market scale of NFC payments will reach USD 411 billion in 2022, with an annual growth rate of up to 48% (Transparency Market Research, 2017). In Asia, apps for mobile payments are booming. The UBS (2018) pointed out that, as major countries around the world are all moving toward a cashless society, such a development among the “Emerging Asian Markets” has great potential. Therefore, the Taiwanese government’s policy goal is to reach 90% coverage for mobile payments by 2025. However, it is still developing slowly. How to promote this new service and increase the acceptance rate is a critical issue in Taiwan.

Not only in practice but in academia, there have been debates on the topic of mobile payment from different perspectives. Among these perspectives, this study has noted that the formation of trust is a

critical factor influencing people's adoption of mobile payments. Through a review of the literature, we discovered that "trust" has referred to a variety of concepts in past studies, including different objects and influencing factors of trust. In summary, this research hopes to explore the formation of trust in mobile payments. The main research questions include the following: What role does trust play in influencing the intention of the general public to continue adopting mobile payments? What standards do consumers trust?

To summarize and clarify proposed questions. This study integrates UTAUT 2 (Unified Theory of Acceptance and Use of Technology) and trust transformation theory to explore the intentions of people adopting mobile payments.

Literature review

Trust and its transfer

Trust is often built up from long-term interactions between the two parties or based on the commonalities and familiarity between the parties (Zucker, 1986). Therefore, for something with which consumers have no prior interactive experience, it was found that trust or belief could be transferred from a third party to other objects (Strub & Priest, 1976; Milliman & Fugate, 1988; Uzzi, 1996). Strub & Priest (1976) already discovered the concept of the transfer of trust in their study, stating that "when a third party vouches for an unknown object as dependable, whether or not the person trusts this new object depends on the person's degree of trust in the third party." Based on the concept of the transfer of trust proposed by Strub & Priest (1976), this study further proposed predisposing factors that might influence the overall trust in mobile payments. In other words, this study aims to further understand where the overall trust transferred to mobile payments comes from.

UTAUT2 and trust

The framework of this study rests upon the UTAUT 2 model proposed by Venkatesh et al. (2012) as its main theoretical basis. In the past, Scholars have pointed out that, in the environment of e-commerce and mobile payments, adding the factor of trust improves the explanatory power of UTAUT 2 for public behavioral intention. This study thus first integrated the trust factor into the UTAUT 2 model. Past publications have indicated the correlations among trust, performance expectancy, and effort expectancy (Alalwan et al., 2017; Khalilzadeh et al. 2017). Furthermore, after integrating UTAUT 2 theory and trust, Alalwan et al. (2017) discovered that trust plays a critical role in consumers' intentions to adopt mobile banking or related businesses. Enhancing trust may not only directly increase usage intentions, but also indirectly influence consumers' intentions by enhancing performance expectancy. Khalilzadeh et al. (2017) also mentioned that the higher the level of trust that consumers have in mobile payments, the more likely that they are to subjectively believe it is easier to complete transactions with this payment method.

Trust in mobile financial services

By conducting a systematic review of studies in the last 15 years, this study collected and referred to extensive literature associated with user trust on mobile payment and mobile banking from those studies from 2003 to 2018. Finally, four trust targets were summarized, as organized in the Table 1.

Table 1. Trust targets of mobile financial services

Sources	Trust type	Trust targets			
		SP	MD	MS	ST
Alalwan et al. (2017)	Overall trust	V			
Gao & Waechter (2017).	Initial trust	V			V
Khalilzadeh et al. (2017).	Overall trust				V
Malaquias & Hwang (2016)	Overall trust	V			
Xin et al. (2015).	Initial trust	V	V	V	
Arvidsson (2014).	Overall trust	V			

Sources	Trust type	Trust targets			
		SP	MD	MS	ST
Hanafizadeh et al. (2014)	Overall trust	V			
Masrek et al. (2014).	Overall trust	V	V	V	
Oliveira et al. (2014).	Initial trust	V			
Zhou (2012 ^a)	Overall trust	V			
Zhou (2012 ^b)	Initial trust	V			
Bangdao & Roscoe (2011)	Overall trust		V		
Lin et al. (2011).	Initial trust				V
Lu et al. (2011).	Initial trust	V			
Chandra et al. (2010).	Overall trust	V	V		
Koenig-Lewis et al. (2010)	Initial trust	V			
Luo et al. (2010).	Initial trust	V			
Kim et al. (2009).	Initial trust	V			
Shin (2009).	Overall trust	V	V		V
Dahlberg et al. (2003).	Overall trust	V	V		V
Siau & Shen (2003).	Initial and continue trust	V	V		

SP: trust for the mobile payment service provider, MD: trust for mobile device, MS: trust for mobile Internet service provider, ST: Trust for transacting vendor

Research model

The main theoretical underpinnings of this study consisted of UTAUT 2 and trust transfer, proposed by Venkatesh et al. (2012) and Strub & Priest (1976), respectively. UTAUT 2 was first used as a basis and integrated with overall trust factors. Then the concept of trust transfer was used as the basis and incorporated with the four antecedents of trust summarized in this study to develop an integrated framework. By doing so, this study aimed to understand the main sources from which user trust in mobile payments is transferred, in the context of Taiwan. As shown in Figure 1, due to the specificity of the research context, this study initially adjusted the price value in UTAUT 2 into monetary costs and gains. Eventually, after testing the content validity based on expert judgment, this study combined monetary costs and gains into perceived value, as proposed by Kim et al. (2007).

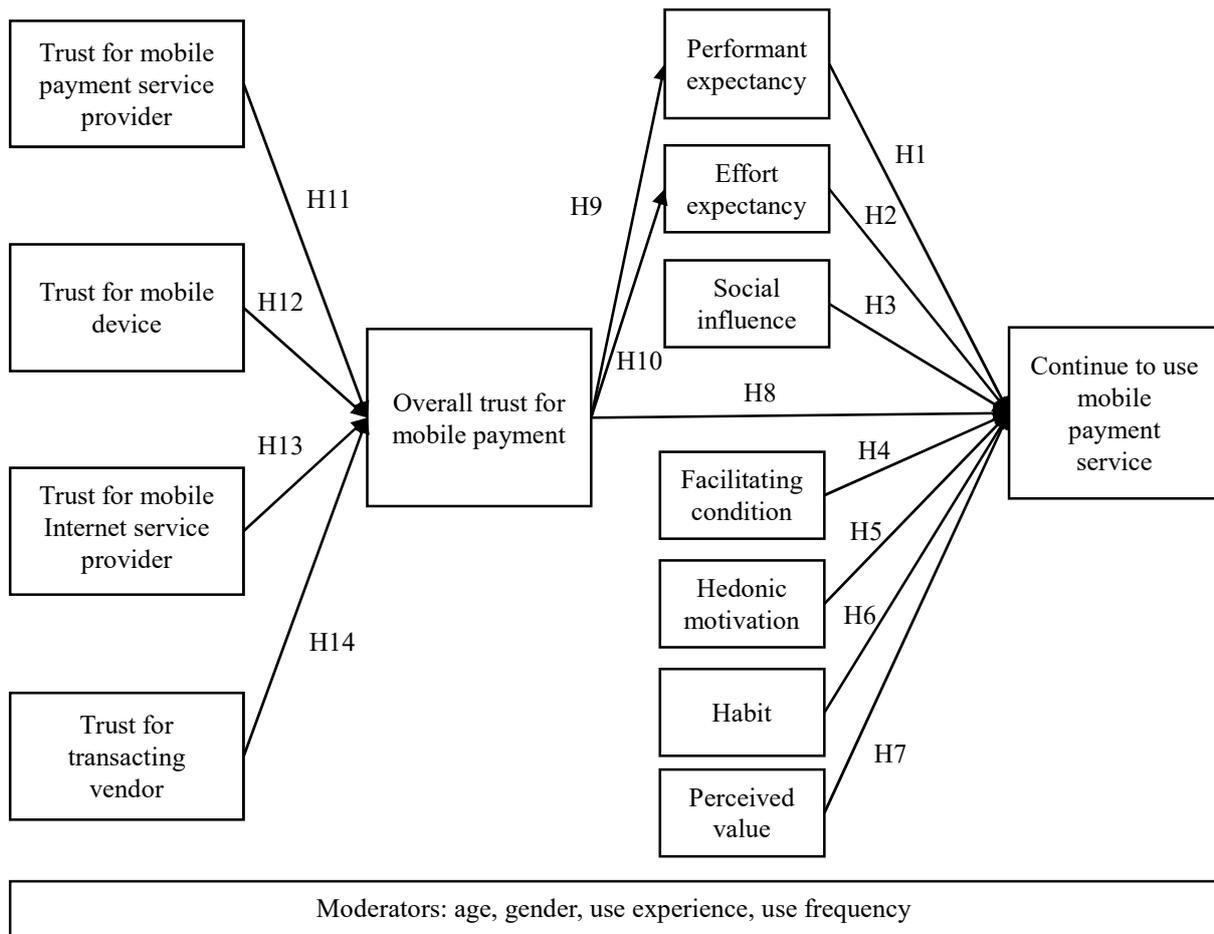


Figure 1. Research Model

Research hypotheses

Following hypotheses included in the proposed research model. They can be classified into four categories: (1) H1 to H7 are inferred from UTAUT2, (2) The central role of trust, (3) inferred from trust transfer, and (4) moderating effect.

(1) H1 to H7 are inferred from UTAUT2.

H1: Performance expectancy positively affects the intention to use mobile payment continuously.

H2: Effort expectancy positively affects the intention to use mobile payment continuously.

H3: Social influence positively affects the intention to use mobile payment continuously.

H4: Facilitating conditions positively affect the intention to use mobile payment continuously.

H5: Hedonic motivation positively affects the intention to use mobile payment continuously.

H6: User habits positively affect the intention to use mobile payment continuously.

H7: Perceived value positively affects the intention to use mobile payment continuously.

(2) The central role of trust.

H8: Overall trust for mobile payment positively affects the intention to use mobile payment continuously.

H9: Overall trust for mobile payment positively affects performance expectancy.

H10: Overall trust for mobile payment positively affects effort expectancy.

(3) Hypotheses inferred from trust transfer.

H11: User trust for mobile payment service provider positively affects overall trust in mobile payment.

H12: User trust for mobile device positively affects overall trust in mobile payment.

H13: User trust for mobile Internet service provider positively affects overall trust in mobile payment.
 H14: User trust for transacting vendor positively affects overall trust in mobile payment.

(4) Hypotheses regarding moderating effect

H15a: “Gender” moderates the relationships between H1 and H8.

H15b: “Age” moderates the relationships between H1 and H8.

H15c: “User experience” moderates the relationships between H1 and H8.

H15d: “Frequency of use” moderates the relationships between H1 and H8.

Research design

The survey method is employed to conduct preliminary data collection and research model verification. The research subjects were Taiwanese who had used mobile payments. Convenient sampling through online questionnaires was implemented to collect research data.

Instrument development

Measurements from previous papers were employed to measure variables in this study. They are summarized in the table 2. Besides, 7-points Likert type scale which from very agree to very disagree is used to measure these items. With pretest and pilot, we finally have the table 2 measurements.

Table 2. Measurements

Variables	References
Performance expectancy (PE)	Venkatesh et al. (2012)
Effort expectancy (EE)	Venkatesh et al. (2012)
Social influence (SI)	Venkatesh et al. (2012)
Facilitating condition (FC)	Venkatesh et al. (2012)
Hedonic motivation (HM)	Venkatesh et al. (2012)
Habit (HB)	Venkatesh et al. (2012)
Perceived value (PV)	Kim et al. (2007)
Overall trust of mobile payment (OT)	Lu et al. (2011)
Trust for mobile payment service provider (SP)	Palvia (2009)
Trust for mobile device (MD)	Gefen (2000)
Trust for mobile Internet service provider (MS)	McKnight et al. (2002a; 2002b)
Trust for transacting vendor (ST)	Gefen et al. (2003)
Continue to use mobile payment service (CU)	Venkatesh et al. (2012)

Data analysis

Demographic

A total of 683 valid copies were collected during the official questionnaire survey, including samples of various age groups from 18 to over 61 years. With regard to gender, there were 387 males (56.6%) and 296 females (43.4%), which indicated a near 50/50 gender ratio. With regard to user preference, 256 participants (37.4%) mainly used Jkos Pay, and 253 participants (37%) tended to use LINE Pay, making them the top mobile payment services by choice. In addition, 442 participants (64.7%) used mobile payments mainly at convenience stores, making them the most common vendor sites in this regard. The above demographic statistics yielded consistent results with the market survey by the Institute for Information Industry (2019), which indicated that the research samples were representative.

Reliability and validity

In order to understand whether the measurement tool used in this study was well-suited for the research context of Taiwan, the reliability and validity of each variable and the corresponding items were analyzed. In cases where all the variables had a Cronbach’s alpha coefficient exceeding the 0.7 threshold, their composite reliability (CR) and average variance extracted (AVE) exceeded the 0.7 and 0.5 thresholds, respectively. In addition, the factor loading of each questionnaire item was greater than 0.5,

which fulfilled the required standard (Nunnally, 1978; Luo et al., 2010). Among the questionnaire items, FC4 failed to meet the criterion of a factor loading greater than 0.7 and was consequently removed. The subsequent analysis was then conducted, and all the remaining items met the criterion of a factor loading above 0.7.

Regarding the discriminant validity analysis, comparisons between the square root of AVE and other correlation coefficients were used. The results indicate that the measurements have acceptable discriminant validity for the following analysis.

Results

The statistical analysis software Smart PLS was adopted to calculate the path coefficient and validate the research hypotheses. The Smart PLS bootstrapping function was employed to perform repeated sampling and compute the t-value using the bootstrap method. The number of bootstrap samples was set as 5,000 to build a more reliable model. From the results of the hypothesis testing, we can find that most of the hypotheses are supported except for hypothesis 3 and 13. About the results of moderation effect, this study discover the following results. The moderating effects that fit the description of UTAUT 2 included those between age and H3: “social influence → intention of continuous usage,” user experience, and H1: “performance expectancy → intention of continuous usage,” user experience, and H3: “social influence → intention of continuous usage,” and user frequency, and H7: “perceived value → intention of continuous usage.”

Conclusions

The rapid evolution of mobile payments has taken the global consumer market to a new milestone. Each country has been faced with distinct progress and distinct challenges during the development of mobile payments. The issue of trust has become the shared focus in both academia and in practice. Researchers hope to better understand the formation of trust among consumers in order to strengthen their trust in mobile payment services and further assist in increasing the intention of consumers to use mobile payments. However, we found that past studies held different perspectives and opinions on the objects of trust in mobile payments, causing a lack of a systematic reference framework in practice. In order to overcome the above shortcomings, the major purpose of this study is to understand the antecedents and consequences of overall trust for mobile payment service to provide insights for its diffusion in Taiwan. By integrating UTAUT2 and theory of trust transfer, we proposed an integrated model and test it empirically. Through online questionnaire survey, we propose the following three major findings. First, we propose the importance of these four kinds of trusting targets from high importance to low importance is trust for mobile device, trust for mobile payment service provider, trust for store, respectively, and the relatively unimportant is trust for mobile service provider. Additionally, we find the social influence has significant negative impact to mobile payment continuous use intention in Taiwan. These findings can offer directions for future research and practices.

Finally, although the authors invested efforts to conduct this study, it also has limitations. For example this study only collects data from online participants. Maybe it exist the difference between online and offline users. In the future, we can collect more data and make comparisons. Additionally, as mentioned in the beginning of this paper, government policy is also critical in the promoting of mobile payment service. However, in our proposed model, above factor doesn't include. In the future, we can focus on the role of government for advanced study.

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