

Factors that Affect Mobile Telephone Users to Use Mobile Payment Solution

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ABSTRACT

Providing a convenient payment solution to mp3 users is one of the alternatives that can promote legal mp3 downloading. However, before the success of the payment solution can be determined, it is essential to understand whether it would be well-accepted by the users. This paper examines factors that influence the intention to use a mobile payment solution for mp3 downloading among university' students. Drawing from the Technology Acceptance Model, Theory of Planned Behaviour and previous literatures, five factors were hypothesized to influence the intention to use the payment solution, namely perceived usefulness, perceived ease of use, trust, perceived price level, and peer influence. Final year business students at a public university in the southern part of Malaysia were chosen as respondents for this study. Multiple regressions were employed to analyze the data. Two factors were found to have significant effect on the intention to use the payment solution, which were trust and peer influence. Practical implications were proposed and discussed.

Keywords: Technology Acceptance, Payment Solution, Behavioural Intention and Trust.

INTRODUCTION

The advent of wireless and mobile technology has created opportunities and challenges for business communities. The technologies have made mobile payment solutions possible. Mobile payment, which is also called m-payment, is a wireless-based electronic payment system that supports payment for a transaction using

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one's mobile devices such as cellular phones, smart phones, and personal digital assistants (Gao *et al.*, 2005).

Vodafone m-paybill, one of the mobile payment systems currently in existence is a payment solution launched by Vodafone in the United Kingdom. It supports virtual point of sale for micro and small payments and enables customers to charge the amounts to their monthly phone bill or mobile phone prepaid account. A wireless application protocol (WAP) phone or a web browser is the basic requirement for this payment solution. In order to use m-paybill, customers need to register their details online with Vodafone. Once registered, they can pay for products and services on any web or WAP site that accepts m-paybill as payment option and the purchase amount is then charged to the monthly phone bill or deducted from the prepaid account (Wen *et al.*, 2004).

In Malaysia, mobile payment application is also widely used. Although the application is a bit different from the Vodafone m-paybill, in that it is not formally offered by a mobile phone service provider, the transaction process is however quite similar. Malaysian mobile users can use their mobile phones to pay for services such as ring tones, games and information services. They can purchase these services through short message service (SMS) and the charges are made on their mobile phone prepaid credit account or on their monthly mobile phone bill.

In Malaysia, although the actual reasons why university's students download music illegally are not known, one of the possible reasons might be due to a lack of convenient payment system. One way to overcome this illegal music downloading is by introducing a practical and convenient payment solution. A transaction using mobile phone is considered to be the most convenient payment solution for university students because most of them have a mobile phone.

Introducing m-payment solution similar to Vodafone m-paybill among university's students is an attractive proposition. However, before the success of this payment solution can be determined, it is essential to understand whether it would be well-accepted by the potential users. This paper therefore investigates the factors that may influence the intention to use a m-payment solution for mp3 downloading among university's students.

RELEVANT LITERATURE

Technology Acceptance Model

The Technology Acceptance Model (TAM) (Davis *et al.*, 1989) is a widely used model in information system field and presents an important theoretical contribution toward understanding Information System (IS) acceptance. TAM aims "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimoniously and theoretically justified" (Davis *et al.*, 1989) (p. 983).

TAM focuses on the attitudinal explanations of intention to use a specific technology or service (Nysveen *et al.*, 2005). Five variables are included in TAM which are: perceived usefulness, perceived ease of use, attitude toward using, behavioural intention and actual use. The two specific variables, namely perceived usefulness and perceived ease of use, are hypothesized to be the fundamental determinants of user acceptance (Davis *et al.*, 1989). Perceived usefulness is defined as the expectation that the technology will enhance one's job performance and, perceived ease of use is defined in terms of the belief that using the technology will be free of effort (Davis *et al.*, 1989).

As shown in Figure 1, perceived ease of use is hypothesized as the predictor of perceived usefulness. Both perceived usefulness and perceived ease of use predict attitude toward using a system. Attitude toward using and perceived usefulness influence the user's behaviour intention to use the system and the behaviour intention will eventually predict the actual use of the system.

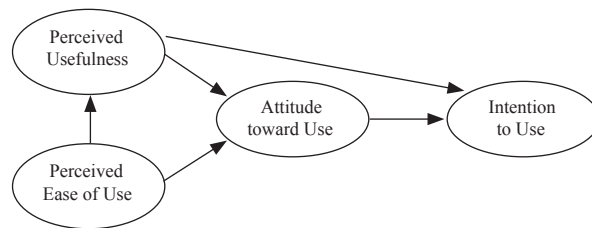


Figure 1 Technology Acceptance Model (Davis *et al.*, 1989)

TAM has received much academic attention. The model has been tested in a wide variety of technologies and research settings. Wan and Che (2004) used TAM to investigate factors that influence Chinese air travellers to use electronic ticketing (e-ticketing). Five airports were chosen from a total of 143 civil airports in China. The results indicated that attitude toward e-ticketing was significant in explaining the intention to use e-ticketing. Perceived usefulness and perceived ease of use were found to be significant in influencing the attitude toward e-ticketing.

In another study investigating factors that may affect mobile Internet acceptance among mobile phone users in Korea, Cheong and Park (2005) had found that perceived usefulness and perceived ease of use had positive relationship with the attitude toward mobile Internet. They also found that perceived price level had a negative relationship with the attitude toward mobile Internet and, attitude toward mobile Internet was found to be the most significant factor in predicting the behavioural intention to use mobile Internet.

Based on the study on 269 college students in two universities in India, Fusilier and Durlabhji (2005) had found that perceived usefulness and perceived ease of use were significant factors in predicting the students' intention to use the

Internet. Finally, in a recent study, Md-Nor (2008) in his study on the Internet banking acceptance had found that perceived usefulness and perceived ease of use, both had significant effect on the intention to use Internet banking for Malay and Chinese ethnic groups. The results also showed that perceived usefulness had a higher effect on the intention among Chinese as compared to the Malays.

Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) (Ajzen, 1991) postulates three conceptually independent determinants of a behavioural intention which are attitude, subjective norm and perceived behavioural control (Figure 2). According to Azjen and Fishbein (1980), attitude is determined by a person's belief that a behaviour leads to a certain outcome and the person's evaluation of those outcome, whether favourable or unfavourable. Subjective norm refers to a person's perceptions of what relevant others are likely to think about the behaviour, as well as the extent to which the person wishes to comply with those relevant others. Relevant others refer to individuals or groups whose beliefs may be important to the person (Mathieson, 1991). Examples of relevant others are parents, siblings, friends and colleagues. Perceived behavioural control refers to a person's perception of how easy or difficult it is to engage in a particular behaviour, which may depend on past experiences, second-hand information and anticipated assistance and impediments.

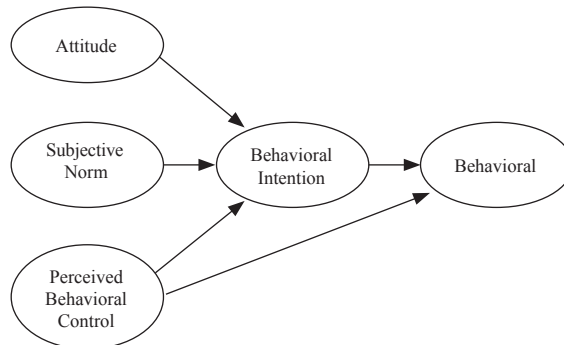


Figure 2 Theory of Planned Behaviour (Ajzen, 1991)

TPB has also received a considerable empirical support from researchers. Joo and Pei (2002) utilized TPB to examine Singaporean investors' intention to trade online. Questionnaires were administered to a sample of 363 respondents through an interview conducted in the business district area known as Raffles Place in Singapore. The results showed that attitude and social factors significantly influenced investors' intention towards adopting Internet stock trading.

Lim *et al.* (2002) conducted a survey on the 600 Singapore companies' intention to adopt negotiation support systems (NSS) based on two theoretical models, the TPB and the TAM. Questionnaires were sent to the 600 hundred companies in Singapore via mail. The findings showed that TPB provided a better prediction of intention to adopt NSS compared to TAM, with subjective norm and perceived behavioural control being the most significant determinants of intention.

In a study conducted on 53 banks in Taiwan, Shih and Fang (2004) found that attitude, subjective norm and perceived behavioural control, all influenced banking customers' intention to adopt Internet banking. In another study investigating Internet banking acceptance, Md-Nor and Pearson (2008) found that attitude, perceived behavioural control and subjective norm, all had positive significant effect on the intention to use Internet banking among banking customers in Malaysia. The study also found a significant effect of trust on the intention.

Trust

The cornerstone for a successful and lasting relationship with a customer is trust, as it largely determines the customer's future behaviour and loyalty towards the business (Berry and Parasuraman, 1991). Trust is a complex notion that is not well understood. There is no consensus in literature on what trust is, though many researchers recognize its importance. According to Robbins (1999), trust takes a long time to build, can be easily destroyed, and is hard to regain. Grandison and Sloman (2000) address trust as a firm belief in the competence of an agent to act dependably, securely, and reliably within a specified context.

Many other definitions such as that of Kreitner and Kinichi (1995) address trust as "reciprocal faith in others' intentions and behaviour" (p. 133). Mayer *et al.* (1993) address trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 710).

There are many studies on trust in e-commerce environment that provide empirical support indicating the importance of trust in influencing users' intention to use or engage in a certain behaviour. McKnight and Chervany (2002) investigated the development of trust in Web-based vendor. In the web experiment using 600 students in a public university, they found that the third party icons in promoting trust was one of the most effective contributing factors in influencing consumer trust.

Gefen *et al.* (2003) compared the degree and relative importance of customer trust in an e-vendor between potential and repeat customers. Research subjects were asked to visit www.amazon.com website and go through the process of buying without actually completing the transaction. The study showed that the repeat customers' purchase intentions were influenced by both their trust in the e-vendor

and their perception that the website was useful, while potential customers were not influenced by perceived usefulness, but only by their trust in the e-vendor.

In a study on the influence of trust on the intention to use mobile banking among working adults who were currently pursuing their degree in one open university in Malaysia, Teoh and Md-Nor (2007) had found that perceived security was a significant factor that affected users' intention to use mobile banking.

RESEARCH MODEL

The purpose of this study is to empirically test factors that affect the intention to use mobile payment solution for mp3 downloading. We hypothesized five factors that may affect the intention to use the payment solution (Figure 3). Perceived ease of use and perceived usefulness were drawn from the technology acceptance model. Peer influence (subjective norm) was drawn from the theory of planned behaviour. Perceived price level was drawn from the study of Cheong and Park (2005) and trust, which was drawn from the trust literature.

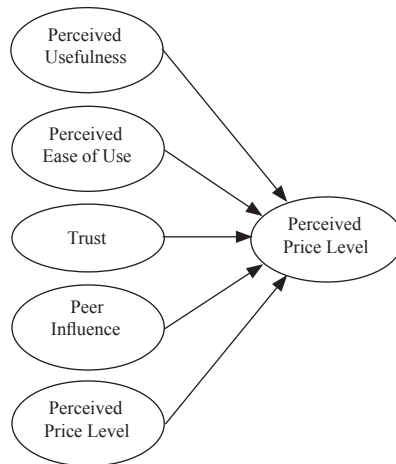


Figure 3 Research model

METHODOLOGY

The target population of this study was marketing students in one public university in Malaysia. The total population is about 240 students representing student's class from year one to year three. There were about 80 students in each programme year. We had adopted a stratified sampling in this study. In ensuring each stratum of the population was represented, we had randomly chosen half of the students from each programme's year to participate in the study.

A paper-based questionnaire was the instrument for this study. Items in the questionnaires were adopted from previous studies. The questionnaire was pilot tested on five students to check its clarity. The final questionnaires were distributed randomly to the target respondents in classroom and the respondents were given about ten minutes to answer the questionnaire. Although the reliability and validity of the items used in the questionnaire was established as they were adopted from previous studies, we did conduct the reliability test and factor analysis to validate its reliability and validity before the final analysis using multiple regressions were conducted.

ANALYSIS

A total of 120 questionnaires were distributed and all were successfully collected, indicating a 100 percent rate of return. There were no incomplete questionnaires and all of them were used in this study. Table 1 provides the respondents' demographic profile. Almost 70 percent of the respondents were female while the remaining 30 percent were male respondents. Their ages ranged from 19 to 23 years. The respondents comprised 43 percent Malays, 50 percent Chinese, 6 percent Indians and 1 percent other races.

A principal component analysis with varimax rotation was performed to check on factor validity. The results of the factor analysis showed that the KMO value was 0.838, which was higher than the recommended minimum value of 0.6 (Kaiser, 1974) and Bartlett's test of sphericity (Barlett, 1954) was significant, supporting the factorability of the correlation matrix. All items relatively load well on their factor (Table 2). Their Chronbach's alpha were also higher than the benchmark of 0.7 as recommended by Hair *et al.* (1998).

Table 1 Frequency and percentage distribution of respondents' profiles

Variable	Group	Freq	%
Gender	Male	37	30.8
	Female	83	69.2
Race	Malay	52	43.3
	Chinese	60	50.0
	Indian	7	5.8
	Others	1	0.8
Age	19 years old	2	1.7
	20 years old	20	16.7
	21 years old	50	41.7
	22 years old	28	23.3
	23 years old	20	16.7

Table 1 (Continued)

Year of Study	First year	40	33.3
	Second year	40	33.3
	Third year	40	33.3
Experience in mp3 downloading	Yes	85	70.8
	No	35	29.2
Payment experience	Yes	8	6.7
	No	112	93.3
Preferred price of mp3	Free	37	30.8
	RM0.10 – RM0.50	16	13.3
	RM0.60 – RM1.00	35	29.2
	RM1.10 – RM1.50	4	3.3
	RM1.60 – RM2.00	10	8.3
	Above RM2.00	18	15.0

Table 2 Rotated component matrix

Items	F1	F2	F3	F4	F5	F6
Useful 1	0.78					
Useful 2	0.79					
Useful 3	0.86					
Ease 1		0.75				
Ease 2		0.65				
Ease 3		0.81				
Trust 1			0.67			
Trust 2			0.82			
Trust 3			0.79			
Price 1				0.87		
Price 2				0.85		
Price 3				0.90		
Peer 1					0.82	
Peer 2					0.89	
Peer 3					0.90	
Intent 1						0.75
Intent 2						0.84
Intent 3						0.83
Cronbach alpha	0.89	0.81	0.88	0.89	0.88	0.89

Note: None of the items were deleted. Only loading >0.3 are shown; Extraction method: principal Component Analysis; Rotation Method; Varimax with Kaiser Normalization.

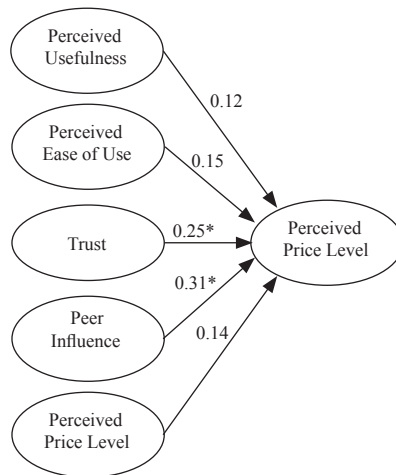
Table 3 shows the regression results. Multicollinearity is a major concern in multiple regressions analysis. As a rule of thumb, a VIF greater than 10 indicates a multicollinearity problem (Myers, 1990). As shown in Table 6, VIF for all variables were less than 10 indicating no threat of multicollinearity.

Factors that Affect Mobile Telephone Users to Use Mobile Payment Solution

Table 3 Regression results

Multiple $R = 0.68$					
R square = 0.46					
Adjusted R square = 0.44					
Standard error = 0.6271					
	DF	Sum of squares	Mean square		
Regression	5	38.413	7.683		
Residual	114	44.832	0.393		
F = 19.536	Significance F = 0.000				
Variable	Beta	t	Sig.	VIF	
Perceived Usefulness	0.122	1.321	0.189	1.810	
Perceived Ease of Use	0.146	1.540	0.126	1.900	
Trust	0.248	2.525	0.013	2.045	
Perceived Price Level	0.144	1.851	0.067	1.273	
Peer Influence	0.311	4.283	0.000	1.114	

The final model was significant. The R-square value showed that 46.1 percent of the variation in the intention to use m-payment solution was explained by all the five independent variables. The results also showed that only two factors were found statistically significant in affecting the intention i.e., trust ($\beta = 0.248$, $p < 0.05$) and peer influence ($\beta = 0.311$, $p < 0.05$). The final model was shown in Figure 4 below.



Note: * significant at <0.05

Figure 4 Final model

DISCUSSION AND CONTRIBUTION

Previous studies had shown that perceived usefulness was significant in explaining the usage intention. Surprisingly, in this study perceived usefulness was found insignificant in influencing the intention to use m-payment solution. The finding was unexpected as we had expected that the convenience of m-payment solution would attract and influence the respondents to use it. The possible reason for the finding might be due to the availability of other alternatives that could be used by the respondents to get the mp3 and paid for it. For example, they might have got the mp3 from shops, where they could pay cash and immediately got the mp3, which were more convenient and efficient. So, the m-payment proposed was probably considered by them as not that useful.

In this study, the perceived ease of use effect on the intention to use m-payment solution was also not supported. The finding was probably due to the sampling frame chosen. The subjects of this study were undergraduates and were considered highly computer-literate. There was a high possibility that they will not find using m-payment solution difficult. As a result, perceived ease of use did not influence their intention to use it.

The term of trust is defined as the dimension of a business relationship that determines the level to which each party feels they can rely on the integrity of the promise offered by the other (Kolsaker and Payne, 2002). This study had found that trust was a significant factor in affecting the intention to use m-payment solution. The result was not surprising given the characteristics of the payment solution, which was similar to the online transactions. There might be concerns on the security of personal information such as identification card number, contact number, and phone account to be shared and lost.

Perceived price level is defined as the perceived level of value that individuals are willing to pay for a service (Cheong and Park, 2005). In the development of behavioural intention, individuals may compare the benefit from the service to the cost of using the service. In this study, it was found that the perceived price level did not significantly affect the intention to use m-payment solution. The result was not expected as we had expected the price to pay to use the service would affect the usage intention of the service.

Social acts bring internally generated feelings of self respect or pride, while failure to act in that particular way may invoke the feelings of shame or self-reproach (Kalafatis *et al.*, 1999). This study had found that peer influence, among others, was the most significant factor in influencing the usage intention. The result was expected as respondents were at their prime age and their behaviours tended to be influenced by those who were closed to them. This result also supported findings in other related studies such as Hu *et al.* (1999) and George (2004).

Practical Implications

The results of this study had several practical implications. A significant positive relationship between trust and behavioural usage intention suggested that trust had played an important role in influencing individuals' intention to use m-payment solution. Therefore, m-payment service providers should ensure a private and secured payment system to gain users' confidence in using m-payment solution.

The findings of this study indicated that peer influence was an important factor that influenced individuals' intention to use m-payment solution. This study also found that peer influence was the most influential factor in explaining the usage intention of m-payment solution. The m-payment service providers might want to explore creative promotional activities to promote the payment solution. "Introduce the service to a friend and get rewarded" is one marketing activity that can be explored. Furthermore, the service providers should also provide high service quality in order to ensure positive word-of-mouth, especially among the youth.

CONCLUSION

This study had examined factors that influenced the university students' intention to use m-payment solution. Two factors namely trust and peer influence were identified to have significant relationship with the behavioural usage intention of m-payment solution. The regression coefficient also revealed that peer influence was the most influential factor in explaining the university students' usage intention. Practical implications were discussed and suggestions put forward could be used by the communication service providers to formulate strategies to enhance the adoption of m-payment solution.

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