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Millennials' Perception on Mobile Payment Services in Malaysia

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Abstract

In the early of 21st century, mobile payment became a hot topic after the burst of the internet, however its services are considered in their infancy stage and still quite new to the consumers in Malaysia. Therefore, there is a need to investigate the factors affecting consumers' intention especially among the millennials to use mobile payment services in Malaysia which encourage the development of mobile payments as an innovative alternative payment method. In this study, perceived usefulness, perceived ease-of-use, perceived credibility and social influence were examined to identify the relationships with the consumers' intention to use mobile payment services in Malaysia. The Extended Technology Acceptance Model (TAM) was used to construct the research framework of this study. Self-administered questionnaire was as the data collection tool in this study and 300 samples from Peninsular Malaysia were collected for data analysis. The findings show that all suggested factors have significant impact in affecting the consumers' intention to use mobile payment services in Malaysia with perceived usefulness proved to be the strongest determinant. The implication and limitation of this study were discussed at the end of this paper.

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Keywords: E-Commerce; Mobile Payment; Mobile Commerce; Information System

1. Introduction

In the past 20 years, there are many new technological advancement, interesting innovations and changes of business practices in the financial information system and technology[1]. The advanced information communication and technology (ICT) have played a vital role in driving and shaping these innovations[2]. Mobile payment (m-payment) is one of the technology-based business innovations that have been shaping the financial services

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landscape in the late 2000s up to the present[3]. Today, mobile technologies have become increasingly adopted but mobile payment services are surprisingly not frequently applied in Malaysia. Mobile payment services are considered in their infancy stage and still quite new to the consumers in Malaysia.

Thus, this study hopes to provide insight for the mobile payment services development in Malaysia by investigating the key factors in affecting consumers' intention to use mobile payment services. The provision of mobile payment is very important to the electronic and mobile commerce organizations to achieve a competitive advantage. There are several studies that have looked into the mobile payment services from the user's acceptance and technical perspectives in other countries. Past researches have given a limited understanding of the factors in consumers' intention to use mobile payment services in Malaysia. There is little effort to fill a gap in understanding the key factors affecting the consumers' intention to use mobile payment services in Malaysia which drive the implementation of mobile payment to achieve its expectation.

This research will not only help mobile payment service providers to develop better consumers acceptance of mobile payment services, but also provides insights to people who have the intention to become entrepreneur using mobile payment service as a strategy for competitive advantage with regards to relationship marketing.

2. Background information

In this section, relevant information regarding the paper is discussed as well as the explanation on the theoretical framework for the study.

2.1. Types of mobile payment

The payment method evolution starts from barter to currency, currency to check, check to credit and now mobile payment is the focus of electronic and mobile commerce. Smart Card Alliance[4] stated that Mobile payments are classified as contactless and remote based on the type of the supporting technology.

Remote mobile payment refers to the transaction that is carried by using a mobile device to without interacting directly with the merchant's physical point of sale (POS) system such as conducting electronic commerce over the mobile internet, transferring funds through a mobile application and downloading a chargeable news articles[4]. It relies on the technology such as short message service (SMS), secure mobile browser or mobile application [4].

Contactless mobile payment is known as proximity mobile payment as well which the consumer present at the point of sale (POS) to pay for goods or services by using mobile devices. It requires an interface between the mobile device and the merchant's payment terminal which are conducted with the consumers physically. It can be applied in both face to face between consumer and merchant and unattended point of sale location such as vending machines.

Near Field Communication (NFC) is one of the proximity mobile payments. Near Field Communication (NFC) also known as mobile contactless payment and it is a mobile payment at the point of sale (POS). An NFC-enabled device is installed with payment application and personalized with a payment account such as credit, debit and prepaid cards issued by the financial institution[5]. In order to conduct the transaction via NFC, consumers have to tap the NFC-enabled mobile device close to the merchant's contactless payment terminal. It makes transaction much interesting and convenient. NFC payment is now available with both Android and IOS version such as Soft card, Google Wallet and Apple Pay.

2.2. Hypothesis development

In order to enhance the prediction of the intention to use mobile payment service in Malaysia while retaining the constructs from TAM, we consider TAM as a starting model of the research and extend it with additional constructs which important to behavioral intention to use mobile payment services. The research model that consists of four constructs as such perceived usefulness, perceived ease of use, social influence and perceived credibility is proposed based on the findings of prior researches that broadens and deepens TAM by introducing new constructs and explaining the existing variables through this hypothesis development.

2.2.1 Perceived usefulness

One of the determinants for the slow diffusion of mobile payment could be the failure in introducing a clear advantage of using mobile payment to the potential users. According to the diffusion theory stated by Rogers[5], the users are willing to accept the innovations if the innovations have certain advantage to them with compared to the existing solutions. Based on the context of TAM, this is reflected by the construct of perceived usefulness. According to Davis[6], usefulness (PU) is defined as the extent of a person believes that using a system will improve his or her job performance. The influence of perceived usefulness on intention to use has been tested by several existing research studies. Wong and Hiew[7] found that the usage of mobile commerce is highly affected by the usefulness of the mobile devices which includes personalization, ubiquity, localization, timeliness and network stability. Toh, T. W. et al[8] stated that perceived usefulness is the most important determinant to predict consumers' intention to use mobile commerce in Malaysia and indicated that perceived usefulness played a vital role in affecting the behavioral intention of implementing a new innovation of technology. The perceived usefulness is defined as the extent to which a person believes that the use of mobile payment will improve his or her performance in daily activities in their study. This construct also shows how mobile payment services can help the consumers to achieve their task-related objectives, such as efficiency and effectiveness. The following hypothesis is suggested.

H1. Perceived usefulness has relationship with consumers' intention to use mobile payment services.

2.2.2 Perceived ease-of-use

According to Davis[6], an individual might find that the system is difficult to use although he or she may believe that the system is useful. Since there are some technical limitations of mobile devices, ease of use is considered as a critical construct in adoption of mobile applications[9]. Perceived ease of use (PEOU) refers to the extent to which a person believes that using the system would be free of mental and physical effort. For instance, an individual may find using mobile payment is tedious and complex because of the constraints of the features of mobile devices for instance its small display screen or difficulty to enter the information by using mobile devices[9]. Consequently, mobile payment service must be easy-to-use or adopt. This motivates us to further determine the relationship between perceived ease-of-use and consumers' intention to use mobile payment services. However, it is important to be clear that it is the perception of ease of use than the characteristics of the actual system which highlighted in this construct. Hence, the following hypothesis is proposed in this study:

H2. Perceived ease of use has relationship with consumers' intention to use mobile payment services.

2.2.3 Perceived credibility

Perceived credibility is defined as the consumers' judgement on the privacy and security issues of using mobile payment services. Credibility can be categorized into three areas which are system security, transaction and legal. This is because mobile payment service can only be considered as confidential when all the transaction are capable of satisfying consumers' needs and their expectation towards security[10]. Wang et. al.[10] had confirmed that perceived credibility has significant relationship with the technology acceptance of consumers significantly. Luan and Lin[11] stated that perceived credibility strongly influence on consumers' intention to use mobile banking. Their findings also revealed that perceived credibility has more impact on the consumers' intention to use mobile banking than perceived usefulness and perceived ease-of-use. Since the impact of perceived credibility on intention to use an online technology is high, this construct is hard to be ignored in this study. Hence, the following hypothesis is suggested.

H3. Perceived credibility has relationship with consumers' intention to use mobile payment services.

2.2.4 Social influence

Social influence happens when the consumer's behavior is influenced by others. Chong[12] stated that the influence from peers, family and media affects individual in decision to adopt m-commerce. According to Dahlberg et al.[13], during the assessment of the acceptance of technological innovations, the social influence of the decision maker

should be considered. This is especially in the case for the innovation in the early stage of development or diffusion because the users lack of reliable information about the innovation in detail. Baa[14] also emphasized that innovation adoption is influenced by the pressure of social system in his new product growth model significantly. Fan et al.[15] stated that users are more likely to recommend or suggest a service to others if they are satisfied with the service earlier. As Malaysia is a collective society, the social influence might be significant impacted the consumers' intention to use mobile payment as the consumers tend to seek opinion from their families and friends regarding mobile payment experience[18.] Khalifa and Cheng[16] also stated that social influence highly effect on consumer intention to use mobile commerce. Toh, T. W. et al[18] clarified that social influence has strong correlation on consumers' intention to use mobile commerce. This finding support prior studies[18, 19, 20] that it is important to incorporate social influence as one of the construct to predict the adoption of mobile application. Therefore, we incorporate social influence as one of the construct in the research model. Social influence is defined as a person's perception that the people who are important to him or her (i.e. close friends or family members) suggest he or she should or should not perform the action toward the usage of mobile payment services. The following hypothesis is suggested.

H4. Social influence has relationship with consumers' intention to use mobile payment services.

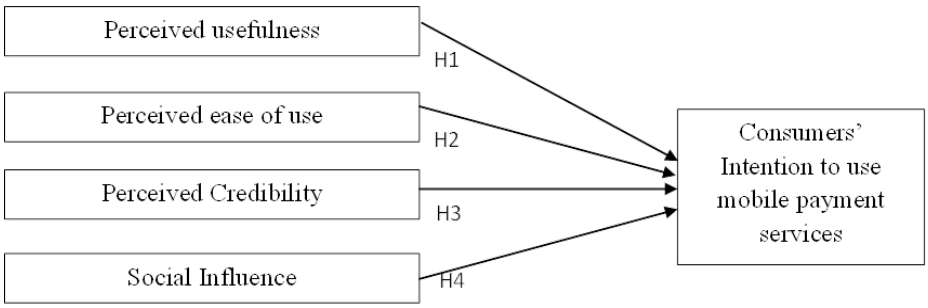

Fig 1. Research framework.

3. Research methodology

This study was carried out using a self-administered questionnaire. The structure of the survey questions are designed as close-ended questions whereby the respondents are given a list of choices to choose from. Therefore, the wordings and language of the survey questions must be understandable for the respondents since there would be limited face-to-face interactions involved between the researcher and the respondents.

The target population comprises the individuals aged of 18 to 39 in Malaysia who are mobile device users. They are people who are still studying or working. This population is considered because they are considered to be deemed likely to use mobile payment in the next future than those without mobile device. The reason for only allowing the mobile device users is because they could provide better outlook with respect to the information and they could be the existing users of mobile payment services. In order to ensure that the sample data are representative and robust enough samples for analysis, the samples size must be determined prudently[21]. According to Roscoe[22], the appropriate rule of thumb sample size is greater than 30 and smaller than 500 for most of the research. Therefore, the selected sample size for this study is 300.

The finalized questionnaire after pilot test was used for data collection. The questionnaire was developed in web-based survey form by using Google Docs and printed in paper form. It was distributed to the public via email, social media and face to face meeting with the respondents. A total of 314 samples have been collected including the online survey but only 300 samples were considered valid for data analysis. 14 questionnaires were excluded as the respondents failed to complete the survey questions. The collected data was analyzed using the SPSS (Statistical Package for Social Sciences) Version 20. This tool was used to conduct validity, reliability and multiple regression testing.

4. Findings

4.1 Demographic profile

The demographic profile consists of a total five variables which includes gender, ethnicity, age, occupation and monthly household income. The gender distribution of the respondents is 63.7% females and 36.3% males. Out of 300 respondents, 255 of them are Chinese which are 85% of the total respondents. It is followed by 12% of Malays and 3% of Indian and other ethnic groups such as Iban and Kadazan from East Malaysia. The result indicates that most of the respondents aged between 25 and 29 years old which represent 65% of the total sample. It is followed by the second highest age group of the range of 18 to 24 years old which represent 19.3% of the total sample. The age range between 30 and 39 years old represent 15.7% of the total samples. In terms of the occupation, the result indicates that most of the respondents are senior executive or executive of an organization which represent 49% of the total samples. It is in line with the age group of the respondents who are majority from age range between 18 to 29 years old. The second highest occupation distribution is professional which represent 16.3% of the total samples. The professional refers to doctor, lawyer, nurse and other professions. 63.7% of respondents less often or never use mobile payment while 36.3% of respondents use mobile payment quite often. According to the result, mobile payment is not popular used among the respondents although they are mobile device users.

4.2 Reason of not using mobile payment service

There are 77 respondents who never use mobile payment service in conducting payment transaction. The data is captured by using multiple responses question, where more than one answers can be chosen by one particular respondent. The reason of not using mobile payment service among the respondents is showed in Table 1. The results show that the main reason of the respondents did not use mobile payment service is because of "the respondents are concerned about their personal information will not be kept confidential while using mobile payment service" which represent 23.8% of the total responses. This is followed by the reason of "the respondents are concerned about mobile payment service will lead to transaction fraud" which represent 20.6% of the total responses. 16.7% of the responses indicated that mobile payment service is not available when the respondents conduct payment transaction.

Table 1. Reason of not using mobile payment service.

Reason of not using mobile payment service	Frequency	Percentage %
It makes the payment transactions less effective (e.g. speed, flexibility).	7	5.6
It is troublesome.	10	7.9
It is difficult to learn how to use mobile payment services.	1	0.8
The steps required to use mobile payment services are difficult.	5	4.0
My friends, family and colleagues do not recommend me to use.	7	5.6
The people around me do not use mobile payment services.	19	15.1
I am concerned about my personal information will not be kept confidential while using mobile payment service.	30	23.8
I am concerned about mobile payment service will lead to transaction fraud.	26	20.6
Mobile payment service is not available when I conduct payment transaction.	21	16.7

4.3 Reliability and validity analysis

In this study, Cronbach's Alpha reliability test was used to examine the reliability of the questionnaire to ensure that each question used in the questionnaire have acceptable level of consistency. Table 2 shows that the Cronbach's Alpha coefficient of the constructs used in the questionnaire. In general, the Cronbach's Alpha coefficient ranges from 0 to 1 whereas the higher value, the higher internal consistency while the lower value, the lower internal

consistency. The Cronbach's Alpha coefficients of the variables are as follows: PU (0.826); PEOU (0.837); SI (0.888); PC (0.847) and ITU (0.813). The reliability coefficients of all are above 0.80 which concurs with the suggestion made by previous research[23]. Thus, the internal consistency of the items in the scale for Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Social Influence (SI), Perceived Credibility (PC) and Consumers' Intention to Use Mobile Payment (ITU) are considered good.

Table 2. Reliability and validity test.

Variable	Cronbach's Alpha	No of items
Perceived Usefulness (PU)	0.826	4
Perceived Ease of Use (PEOU)	0.837	4
Social Influence (SI)	0.888	4
Perceived Credibility (PC)	0.847	4
Consumers' Intention to Use Mobile Payment (ITU)	0.813	2

4.4 Correlation analysis

A single construct in the questionnaire was measured by multiple items. The average score of the multiple items for a construct was computed and used in further analysis. Pearson correlation analysis was conducted to examine the relationship between the variables[7]. According to Wong and Hiew[7], the correlation coefficient value (r) below 0.29 is considered weak; the range from 0.30 to 0.49 is considered medium and 0.50 or above is considered strong. The correlation analysis result was shown in Table 3. The result indicated that there are significant positive correlations among the independent variables at 0.01 confidence level (2-tailed) and the relationship is quite strong which is between 0.341 and 0.763. The results also showed that all the four factors are positively correlated with the consumers' intention to use mobile payment and the results are significant at 0.01 confidence level (2-tailed). However, the correlation coefficient should not go beyond 0.80 to avoid multicollinearity[25]. The highest correlation coefficient is 0.763 which is smaller than 0.80. Hence, it showed that there is no multicollinearity problem in this study.

Table 3. Correlation analysis

	Perceived usefulness (PU)	Perceived ease of use (PEOU)	Social influence (SI)	Perceived credibility (PC)	Consumers' intention to use mobile payment (ITU)
Perceived Usefulness (PU)	1	0.763	0.392	0.557	0.758
Perceived Ease of Use (PEOU)	0.763	1	0.341	0.570	0.694
Social Influence (SI)	0.392	0.341	1	0.504	0.507
Perceived Credibility (PC)	0.557	0.570	0.504	1	0.644
Consumers' Intention to Use Mobile Payment (ITU)	0.758	0.694	0.507	0.644	1

4.5 Multiple regressions

Multiple regression analysis was employed to analyze the relationship between the dependent variable and independent variable and to test the hypotheses of the study. The first hypothesis H1 stated that Perceived Usefulness (PU) has a relationship with consumers' intention to use mobile payment services in Malaysia. From the

results, Perceived Usefulness has statistical significant value (p-value) of 0.000 where it is less than 0.05. There is significant relationship between Perceived Usefulness and consumers' intention to use mobile payment services at 95% of confidence level. Therefore, we can conclude that H1 is significant to this study.

The second hypothesis H2 stated that Perceived Ease of Use (PEOU) has a relationship with consumers' intention to use mobile payment services in Malaysia. Perceived Ease of Use is significantly related to consumers' intention to use mobile payment services in Malaysia at 95% confidence level with the statistical significant value (p-value) of 0.001 where it is less than 0.05. Therefore, we can conclude that H2 is significant to this study.

The third hypothesis H3 stated that Perceived Credibility (PC) has a relationship with consumers' intention to use mobile payment services in Malaysia. From the results of this study, Perceived Credibility (PC) is significantly associated with consumers' intention to use mobile payment services in Malaysia at 95% confidence level with the statistical significant value (p-value) of 0.000 where it is less than 0.05. Therefore, we can conclude that H3 is significant to this study.

The last hypothesis H4 stated that Social Influence (SI) has a relationship with consumers' intention to use mobile payment services in Malaysia. The results showed that the statistical significant value (p-value) of Social Influence (SI) is 0.000 where it is less than 0.05. Thus, Social Influence (SI) has positive relationship with consumers' intention to use mobile payment services in Malaysia at 95% of confidence level. Therefore, we can conclude that H4 is significant to this study.

The result from multiple regression analysis showed that the regression coefficient of Perceived Usefulness is relatively high with comparison to other independent variables. It indicated that Perceived Usefulness is relatively more importance than all other independent variables in the multiple regression model. The beta (β) coefficient of Perceived Usefulness is 0.46, meaning that a 1 standard deviation change in Perceived Usefulness will result in a 0.46 standard deviation change in the dependent variable (ITU) when all other independent variables are held constant. It was followed by the coefficient values of Perceived Credibility (PC), Perceived Ease of Use (PEOU) and Social Influence (SI). Based on the regression analysis results, the regression equation was obtained as below:

$$ITU = -0.258 + 0.460\ PU + 0.216\ PEOU + 0.261\ PC + 0.191\ SI \quad (1)$$

5. Discussion

The results explain that TAM constructs are good in explaining newly emerging context of mobile payment services, but additional features should be added to better reflect this system. The special intention that the respondents gave to the effect of Perceived Usefulness implied that it is important for the mobile payment service providers to build for a critical mass. Consumers seems to be willing to use mobile payment services if they find out that using this alternative payment method has more advantage that using the current payment methods.

6. Conclusions

This study has narrowed the gaps of previous research in terms of investigating the adoption of mobile payment service in Malaysia. It has advanced the mainstream literature concerning mobile payment acceptance, particularly from a country which has potential growth in mobile payment use. This study aids mobile payment service providers to create their competitive strategies that target potential mobile payment users in an effective way. As technology evolves, the competition between the rivals has becoming stiffer since more similar innovation were developed and launched into the market. In order to stay competitive, mobile payment services providers are required to identified the needs of the consumers and create a mobile payment system which is able to fulfill the consumers' needs.

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