Consumers' Adoption of Mobile Payment: Comparison between China and Malaysia

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Abstract

Mobile payment services has emerged as one of the prominent transaction payment methods. China is leading in mobile payment globally while mobile payment in Malaysia still in its infancy. This paper compares the factors in adoption of mobile payment among consumers' in Zuhai, China and Kuala Lumpur, Malaysia. The factors included in the study were perceived usefulness, perceived ease of use, subjective norms and perceived security risk. A cross-sectional, descriptive study was undertaken on 96 smartphone users from China and 51 users from Malaysia. Inferential statistics Mann-Whitney U test was applied to compare between study variables. Spearman's ho correlation was used to identify the association between the study variables and behavioral intention to adopt mobile payment services. The study found significant different between users' perception on subjective norms and perceived security risk in these two city. There was no significant different for perceived usefulness and perceived ease of use between users in Zuhai and Kuala Lumpur. Significant negative linear correlations between perceived security risk and behavioral intention, and significant positive correlations between perceived usefulness, perceived ease of use and subjective norms and behavioral intention were observed from the study. The findings of this study indicate that the consumers in Kuala Lumpur have higher concern on mobile payment services security and greater social influences to adopt mobile payments.

Keywords: Mobile payment, Consumers' Adoption

1. Introduction

The high penetration rate of mobile phone has induced the exploitation of mobile technology. With the advances in mobile technology, mobile commerce has an increasingly profound impact on our daily lives. With mobile devices, consumers read books, listen music, take pictures, play games, retrieved information online and etc. anytime and anywhere. We are being offered with interesting and advantageous new mobile devices and system to assist us in performing our daily lives routines and business activities with ease, faster and convenient. Mobile applications have been integrated into our lives. One promising area of mobile commerce that received growing intention globally is mobile payment.

Mobile payment is a promising and exciting domain that is rapidly developing. Mobile phone plays a major role in the digital business world by changing the traditional business practices and creates many business opportunities. The mobile payment system enables users to do transaction payments using their mobile devices.

Developing countries has an accelerated of no-cash transaction growth rate of 16.5% in 2015–2016 that mainly driven by the adoption of mobile payment (Capgemini & BNP Pribas, World Payments Reports 2018). The global mobile payment revenue is estimated to reach US$930 billion in 2018 (Statista, 2019).

China is a country leading in mobile payment globally. The fast growth of the digital information and economy has change the way of consumption transactions among the China society. The transaction payment method in China has experiencied a great paradigm change from the traditional cash payment method to cashless payment with the use of mobile payment services. Mobile payments transaction volume in 2018 was US$41.51 trillion and it increased more than 27-fold from 2013 (Tan, "Mobile Payments Continue Meteoric Rise", 2019). China has become a cashless society with mobile payment as the mainstream payment method. Alipay and Wechat Pay is the two major players in China mobile payments market that owned 90% of the market share.

In Malaysia, cash and credit card are the two most popular forms of transaction payment compared to mobile payment. Only 8% of Malaysian use mobile wallet as their payment method (Malaysia Payment Landscape 2018, Nielsen Malaysia). Mobile payment still in its infancy in Malaysia. Under the Financial Sector Blueprint 2011–2020 by the Bank Negara Malaysia, the 3rd wave of the transformative wave in Malaysia payments system is mobile payment which starts from 2018.

As the fast growth of mobile payments market in China compare to Malaysia, this study intends to investigate the different factors affecting the behavioral intention in adopting mobile payment as transaction payments method. By understanding the determinants of acceptance of mobile payment will provide theoretical contributions to the field and lead to the development of more effective mobile payment devices and systems.

2. Literature Review

Various technology adoption theories have been developed and applied in research studies to investigate individuals' behavioral intention to adopt new developed technologies. These theories are innovation diffusion theory (IDT), theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), theory of planned behaviour (TPB) (Ajzen, 1991), technology acceptance model (TAM) (Davis, 1989), and Unified Theory of Acceptance and Use of technology (UTAUT) (Vankatesh, et al., 2003). TAM is the most common and robust model applied by research studies to investigate the technology acceptance of new technology innovation on their behavioral intention of adopting the technology (Davis, 1989; Marangunic & Granic, 2015).

TAM developed by Davis (1989) to predict users adoption acceptance of new information systems and technology using two factors – perceived usefulness and perceived ease of use. This study extended TAM by including subjective norm and the perceived security risk in the model.

In the context of mobile payment, perception of perceived usefulness refers to consumers believe it is a convenient way of doing transactions. Perceived usefulness has been applied to investigate the users' behavioral intention of mobile payment adoption (Kim et al., 2010; Chandra et al., 2010; Tobbin & Kuwornu, 2011; Zarmpou

et al., 2012). These studies found that perceived usefulness was a significant factor affects the behavioral intention of consumers to adopt mobile payment services.

The perceived ease of use encompasses to the users perception towards the difficulty level of applying mobile payment services (Davis, 1989). Previous studies reported that perceived ease of use has a positive impact on behavioral intention to adopt mobile payment services (Chen, 2008; Chandra et al., 2010).

Subjective norm refer to the degree of social influence to adopt a new information technology (Venkatesh et al., 2003). It has been applied in TAM to investigate the mobile payment services adoption intention (Lwoga & Lwoga, 2017, Phouthanukitithuworu, 2015, Yang et al., 2012, Hamza & Shah, 2014). These studies found that subjective norm has positive effect on the behavioral intention to adopt mobile payment services.

Perceived security risk is a major concern of users in their adoption intention to use mobile payment services. Past studies reported that perceived security risk has negative impact on the intention to adopt mobile payment services (Lee, 2009; Yang et al., 2012). The security issues that concerned by the mobile payment services users are such as apps security features, password leakage and leakage of personal information (Venkatakrishnan, 2013).

3. Methodology

3.1 Study Instrument

A self-administrated questionnaire was used in this study. The questionnaire consist of six sections that include the respondents' demographic data, three items measuring mobile payments adoption behavioral intention, four items on perceived usefulness, three items on perceived ease of usefulness, four items on subjective norms and six items on perceived security risk of mobile payments adoption among smart phone users in Zuhai, China and Klang Valley, Malaysia. Smartphones users with mobile 4G were included in the study. The questions in the survey were adapted from valid and reliable measures developed by other researchers. The survey statements on a seven-likert scale to indicate the agreement level of respondents from strongly disagree to strongly agree.

3.2 Statistical Analysis

Descriptive statistics were used to demonstrate respondents' demographic characteristics. Categorical variable was measured as percentage. The Shapiro-Wilk test was applied to determine the nature of data distribution. Inferential statistics Mann-Whitney U test, p ,< 0.05) were used to assess the significance among variables in the study. Spearman's rank correlation coefficient ($p < 0.01$) was used to measure the association between the four factors and intention to adopt mobile payment methods. All analyses were performed using SPSS v.21.

4. Results

A total of 147 survey responses were collected, in which 51 was from Klang Valley , Malaysia and 96 was from Zuhai, China.

4.1 Demographic Characteristics

The demographic characteristics of the respondents are presented in Table 1. Almost 64% of the respondents were aged 40 and below which are refer as millennial with female as the dominant gender (n = 94, 63.9%). Malaysian respondents were slightly older than China respondents. More than 80% of the total respondents had tertiary level of education (Bachelor degree, 59.9% and above Master level 21.8%). Malaysian respondents were mostly employed executive while China respondents were mostly students.

Table 1: The Demographic Characteristics of the Study Respondents (n = 147)

Characteristics		China (n = 96)	Malaysia (n = 51)	Total (n = 147)	
		Frequency	Frequency	Frequency	%
Gender	Female	64	30	94	63.9
	Male	32	21	53	36.1
Age	Below 20 years old	37	0	37	25.2
	20–29 years old	25	17	42	28.6
	30–39 years old	4	12	15	10.2
	40–49 years old	25	16	41	27.9
	50–59 years old	3	6	9	6.8
	Above 60 years old	2	0	2	1.4
Education Level	Secondary Education and Below	12	1	13	8.8
	Diploma	12	2	14	9.5
	Bachelor Degree	68	20	88	59.9
	Master Degree and Above	4	28	32	21.8
Employment Status	Employed–Executive Level	17	28	45	30.6
	Employed–Non-Executive Level	14	7	21	14.3
	Unemployed	1	0	1	0.7
	Students	58	14	72	49.0
	Retiree	4	0	4	2.7
	Housewife	2	2	4	2.7

Table 2 illustrates the understanding and usage of mobile payment. Almost 97% of the respondents know about mobile payment and 72.85% of the respondents using mobile payment. The usage rate of mobile payment in was 83.3% and 52.9% for China and Malaysia respondents, respectively. Basically most of the China (95.8%) and Malaysia (98%) respondents know about mobile payment. However, usage of mobile payment was higher among China respondents (83.3%) compared to Malaysia respondents (52.9%). Chi-square test of independence found that there is a significant associated between the usage of mobile payment services and smartphones users in China and Malaysia.

Table 2: Comparisons of Nationality by Understanding and Usage of Mobile Payment

		Yes	No	
Do you know what mobile payment is?	China	92 (95.8%)	4 (4.2%)	$\chi^2(1) = 0.493$ p>0.05
	Malaysia	50 (98.0%)	1 (0.7%)	
	Total	142 (96.6%)	5 (3.45)	
Are you using any mobile payment apps?	China	80 (83.3%)	16 (16.7%)	$\chi^2(1) = 15.532$ p<0.05
	Malaysia	27 (52.9%)	24 (47.1%)	
	Total	107 (72.85%)	40 (27.2%)	

The instrument items in the questionnaire were tested for its reliability. Internal consistency was assessed by using Cronbach's alpha ($\alpha = 0.911$) for all items. Table 3 presents the statistics of reliability measurement. All factors' Cronbach's Alpha are higher than 0.7 (Nunnally, 1978). The test of normality, Shapiro-Wilk test ($p < .000$) indicates that data distribution is not normally distributed (non-parametric).

Table 3: Statistics of Reliability Measurement

Variables	Cronbach's Alpha	Number of Items
Behavioral Intention	0.798	3
Perceived Usefulness	0.888	4
Perceived Ease of Use	0.838	3
Subjective Norms	0.876	4
Perceived Security Risk	0.743	6
Behavioral Intention	0.798	3

4.2 Comparison of Mean Difference between China and Malaysia Users on Mobile Payment

To evaluate whether there was a significant difference between China and Malaysia users perception on mobile payment services and the social influence on adoption of mobile payment. The study applied Mann-Whitney U test. Results of Mann-Whitney U test is presented in Table 4. AS a result of the analysis, there were no significant differences for the perception on perceived usefulness (Mann-Whitney U = 2423.50, p>0.05) and perceived ease of use (Mann-Whitney U = 2237.00, p>0.05) between the users of these two countries. While, there were significant differences for the perception on subjective norms (Mann-Whitney U = 1741.00, p<0.05) and perceived security risk (Mann-Whitney U = 1261.50, p<0.05) and behavioral intention (Mann-Whitney U = 1983.00, p<0.05).

Table 4: Mann Whitney U Test for comparing China and Malaysia Users' Perception

Perception Factor	Rank Group	N	Mean Rank	Sum of Ranks	U	p	Mean difference
Behavioral Intention	China	96	68.22	6549.00	1893.000	0.022	p < .05
	Malaysia	51	84.88	4329.00			
Perceived Usefulness	China	96	73.74	7079.50	2423.500	0.920	p > .05
	Malaysia	51	74.48	3798.50			
Perceived Ease of Use	China	96	71.80	6893.00	2237.000	0.386	p > .05
	Malaysia	51	78.14	3985.00			
Subjective Norms	China	96	66.64	6397.00	1741.000	0.004	p < .05
	Malaysia	51	87.86	4481.00			
Perceived Security Risk	China	96	61.64	5917.50	1261.50	0.000	p < .05
	Malaysia	51	97.26	4960.50			

Table 5: Correlation between Independent Factors and Behavioral Intention

Variables	1	2	3	4	5
Behavioral Intention	1	0.802*	0.757*	0.616*	-0.412*
Perceived Usefulness		1	0.792*	0.669*	-0.422*
Perceived Ease of Use			1	0.726*	-0.417*
Subjective Norms				1	-0.406*
Perceived Security Risk					1

*Significant correlation (Spearman Correlation) p < .01 (2-tailed)

Spearman rank correlation revealed significant negative linear relationship between behavioral intention with perceived security risk (r = -0.412). In addition, it was observed that behavioral intention and perceived usefulness(r = 0.802), perceived ease of use (r = 0.757) and subjective norms (r = 0.616) were correlated positively among each other. The results reaffirm the relationship between independent factors and mobile payment adoption is shown in Table 5.

5. Discussion

This study was conducted to gauge the perception of China and Malaysia consumers on the adoption of mobile payment services. Specifically, it was to look at the influence f ease of use, perceived usefulness, perceived security risk and subjective norms towards intention to adopt mobile payment.

In this study perceived factors behavioral intention, subjective norms and perceived security risk were significantly higher for Malaysia users than China users as the mean rank for Malaysia is higher than China. Social influences from peers, siblings, colleagues on smart phone users to adopt mobile payment has higher influences in Malaysia as it is a new payment model to consumers. Malaysian consumer has high feeling towards society's opinions and recommendation on mobile payment services. Malaysia users also are more concern on the security risk factor in the mobile payment services. They are not confident with the security of the electronic network and the security of the mobile payment apps in the market. For behavioral intention, mobile payment is still a new payment method in Malaysia, consumers have high tendency to use it. There is a high penetration rate of mobile payment in China, thus social influence and perceived on security issues will be lower as it is a common and safe payment mode to deal with transactions in China.

Perception on the perceived usefulness and perceived ease of use were not significantly different among smart phone users between China and Malaysia. Users'

were consistency had the same perception that mobile payment is a useful information technology app that can ease and smoothing the payment and financial transactions.

The negative correlation between behavioral intention to adopt mobile payment services and perceived security risk implies that security risk from various aspects such as personal information and password security was concerned by the users that associated with users' intention to adopt mobile payment services. The positive association between behavioral intention to adopt mobile payment services and other perception factors (perceived usefulness, perceived ease of use, and subjective norms). It can be concluded that satisfactory perception and social influences can lead to constructive intention to adopt mobile payment services. The findings are in line with the results of previous studies ((Lee, 2009; Yang et al., 2012).

6. Conclusion

The findings of this study indicate that consumers are typically concern about the security of the mobile payment services and social influences to adopt mobile payment services are greater in Malaysia. Mobile payment players in Malaysia should enhance the security of their mobile payment apps by referring to the two major mobile payment players in China (Ali Pay and WeChat Pay). Stimulus and promotion actions should be made to accelerate the usage of mobile payment services in Malaysia.

References

Ajzen, I. (1991). The theory of planned behavior. Organizational Bahavior and Human Decision Processes, 50, pp.179–211.

Capgemini and BNP Pribas. (2018). World Payments Reports 2018. Retrieved from https://worldpaymentsreport.com/wp-content/uploads/sites/5/2018/10/World-Payments-Report-2018.pdf

Chandra, S., Srivastava, S. C., and Theng, Y-L. (2010). Evaluating The Role of Trust in Consumer Adoption of Mobile Payment Systems: An Empirical Analysis. Communications of the Association for Information Systems, 27(1), pp.561–588.

Chen, L-D. (2008). A Model of Consumer Acceptance of Mobile Payment. International Journal of Mobile Communications, 6(1), pp. 32–52.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology. Management Information System Quarterly, 13(3), pp. 319–340.

Fisbein, M., and Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research: Addison-Wesley Reading, MA.

Hamza, A., and Shah, A. (2014). Gender and Mobile Payment System Adoption among Students of Tertiary Institutions in Nigeria. International Journal of Computer and Information Technology, 3(1), pp. 1 –20.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An Empirical Examination of Factors Influencing The Intention to Use Mobile Payment. Computers in Human Behavior, 26(3), pp. 310–322.

Lee, M-C., "Factors Influencing The Adoption F Internet Banking: An Integration of TAM and TPB With Perceived Risk and Perceived Benefit", Electronic Commerce Research and Applications, Vol. 8, No. 3, 2009, pp. 130–141.

Lwoga, E. T., & Lwoga, N. B. (2017). User Acceptance of Mobile Payment: The Effects of User-Centric Security, System Characteristics and Gender. The electronic Journal of Information Systems in Developing Countries, 81(3), pp. 1 – 24.

Magaragunic, N., & Granic, A. (2015). Technology Acceptance Model: A Literature Review From 1986 to 2013. Universal Access in the Information Society, 14(1), pp. 81–95.

Nielsen Malaysia. (2018). Malaysia Payment Landscape 2018. Retrieved from https://www.nielsen.com/content/dam/nielsenglobal/my/docs/2018/malaysia-payment-landscape-2018

Nunnally, J. C. (1978). Psychometric theory (2nd ed.)., New York: McGraw-Hill.

Phonthanukitithaworn, C., Sellitto, C., & Fong, M. (2015). User Intentions To Adopt Mobile Payment Services: A Study of Early Adopters in Thailand. Journal of Internet Banking and Commerce, 20(1), pp. 1–29.

Statista (2019). Total Revenue of Global Mobile Payment Market From 2015 To 2019 (in billion I.S. dollars). In Statista–The statistics Portal, Retrieved from https://www.statista.com/statistics/226530/mobile-payment-transaction-volume-forecast/

Tan, X-Y. (2019). Mobile Payments Continue Meteoric Rise. China Daily. Retrieved from http://www.chinadaily.com.cn/a/201903/21/WS5c932294a3104842260b1cc9.html

Tobbin, P., & Kuwornu, J. K. M. (2011). Adoption of Mobile Money Transfer Technology: Structural Equation Modeling Approach. European Journal of Business and Management, 3(7), pp. 57–77.

Venkatakrishnan, V., & Eston, N. (2013). Mobile-Phone Money Transfer Services' Usage In Dodoma Urban, Tanzania. International Journal of Research in Management & Technology, 3(1), pp. 31–36.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information technology: Toward a Unified View. Management Information System Quarterly, 27(3), pp. 425–478.

Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2012). Mobile Payment Services Adoption Across Time: An Empirical Study Of The Effects Of Behavioral Beliefs, Social Influences, And Personal Traits, Computers in Human Behavior, 28(1), pp. 129–142.

Zarmpou, T., Saprikis, V., Markos, A., & Vlachopoulou, M. (2012). Modeling Users' Acceptance of Mobile Services. Electronic Commerce Research, 12(2), pp. 225–248.