

# Factors Influencing the Continuance Usage of Online Mobile Payment Apps: A Case Study of WECHAT Users in China

Isaac Kofi Mensah, Jianing Mi, Feng Cheng

**Abstract**—This research paper seeks to investigate the factors determining the continuance usage of online mobile payment applications among WECHAT users in China. Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI) theory would both be applied as the theoretical foundation for this study. A developed instrument would be administered to the targeted sample of 1000 WECHAT Users in the City of Harbin, China, through an online questionnaire administration platform. Factors such as perceived usefulness, perceived ease of use, perceived service quality, social influence, trust in the internet, internet self-efficacy, relative advantage, compatibility, and complexity would be explored to determine its significant impact on the continuance intention to use mobile payment apps. This study is at the development and implementation stage. The successful completion of this research article would not only provide an insightful understanding of the factors influencing the decision of WECHAT users in China to use mobile payment applications but also enrich the e-commerce adoption literature.

**Keywords**—Diffusion of innovation (DOI), e-commerce, mobile payment, technology acceptance model (TAM), WECHAT.

## I. INTRODUCTION

THE introduction of the internet into the business sphere provided diverse opportunities for business to explore, particularly in marketing their products and services. The introduction of internet technologies into the business environment is known as e-commerce or e-business. Commerce (e-commerce) is considered as the purchasing and selling of goods and services over the internet [1]. Through e-commerce could be in the forms of business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), and consumer-to-business (C2B) [1], [2]. The internet has been the most widespread means of delivering and marketing information, services, and goods to potential consumers [3]. This has shifted the manual way of marketing to the online methods of marketing and shopping. Online shopping is the use of appropriate information and communication technologies to improve and enhance the marketing of goods and services to the consumer.

The consumer shopping behavior is largely determined by

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four psychological factors that include motivation, perception, belief, and attitude [4]. Also, other factors such as personality, demographic factors and the perceptions on benefits of online shopping have an influence on the consumer's decision to engage in online shopping [4]-[6]. Other studies have also determined that consumer online shopping behavior is influenced by factors such as individual perception, consumer psycho-demographic characteristics, website characteristics, and importantly, the social factor [7]-[9]. The shifting of traditional markets to the online arena has raised some for modern day consumers which influences their desire to purchase online. The security and safety of payment and credit cards, preserving the privacy of online shoppers, consumer cognition, and consumer internet experience are considered as the major factors influencing the decision of the modern day consumer to shop online [10].

The individual characteristics of the consumer, environmental factors such as market concentration and national and intentional regulations, product characteristics such as quality and knowledge of a product, online environment characteristics such as security and quality and the online organization attributes also are important elements influencing online shopping [11]. Online shopping consumers can be classified into four groups such as exploration, entertaining, shopping and information shoppers [12].

The objective of this research paper is to examine the factors determining the continuance usage of the online mobile payment of WECHAT users in China.

The rest of the paper is organized as follows: the research theoretical framework, research model, research hypotheses, future research, and conclusion.

## II. RESEARCH THEORETICAL FRAMEWORK

Technology Acceptance Model (TAM) and the Diffusion of Innovation Theory (DOI) will be used as the theoretical framework of this study. TAM and DOI are briefly explained below:

### A. Technology Acceptance Model (TAM)

The Technology Acceptance Model developed by Davis is considered as a powerful model capable of explaining the user adoption and acceptance of technology applications. According to TAM, the two important cognitive beliefs that affect the adoption of technology are perceived usefulness and perceived ease of use (PEOU). PU is defined as, the user's hope that the use of a technology would enable them to

accomplish his or her expected task/job [13], while PEOU is user's trust that the use of a technology would be free of effort [13]. These two factors (PEOU and PU) are significant

predictors of the behavioral intention to use [13]. The Technology Acceptance Model is depicted in Fig. 1.

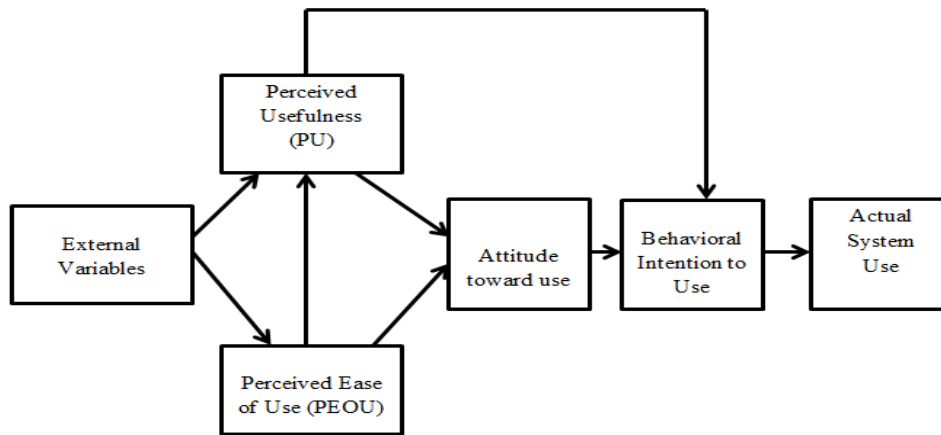


Fig. 1 Technology Acceptance Model (TAM) [13]

TABLE I  
 TAM, DOI, E-COMMERCE ADOPTION STUDIES

Findings	Source
TAM was extended to include predictors such as process satisfaction, outcome satisfaction, expectations, and e-commerce use to explore the actual behavior in E-commerce environment.	[21]
TAM was also modified to include factors such as trust, social presence and perceived enjoyment to determine consumers' intention to adopt online shopping.	[22]
Using TAM to determine the factors contributing to the users' intention to adopt and use e-commerce, it was shown that PU, PEOU and perceived enjoyment were a significant predictor of user adoption of e-commerce.	[23]
Applying the DOI model demonstrated that voluntariness, relative advantage, ease of use, compatibility, trialability, demonstrability, and image had a positive impact on the adoption of online shopping in India.	[24]
In a similar study, it was revealed that relative advantage, triability, and observability affect positively the adoption of e-commerce. However, company culture negatively affects the adoption of e-commerce and complexity does not have a significant impact on the adoption of e-commerce.	[25]
Exploring the factors influencing trust on the performance of social commerce, it was found that consumer's trust in e-commerce has a significant positive impact on trust in social commerce and relative advantage. Perceived relative advantage and result, demonstrability positively affected consumers trust in social commerce. Trust in social commerce positively affects consumer intention to use. However, perceived risk negatively affects the consumer's intention to use.	[26]

Similar studies have confirmed the significant impact of PEOU and PU on the behavioral intention to use [14]-[18].

### B. DOI (Diffusion of Innovation Theory)

The Diffusion of Innovation (DOI) theory was proposed by Rogers [19]. This theory seeks to explain why new phenomenon such as technology is adopted and used by individuals/users. DOI is projected to provide richer perspectives on the adoption of new technology related applications such as e-commerce [20]. According to DOI, the main factors determining the adoption and use of an innovation are Relative Advantage, Compatibility, Complexity, Triability, and Observability [19].

### C. TAM, DOI and E-commerce Adoption Studies

Table I indicates the recent adoption studies applying the TAM and DOI as its theoretical foundations.

### III. RESEARCH MODEL

The research model is shown in Fig. 2. Predictors such as PU, PEOU, perceived service quality, social influence, trust in the internet, internet self-efficacy, relative advantage, compatibility, and complexity are the independent variables.

They have a direct impact on the continuance intention to use mobile payment apps. Internet self-efficacy has a direct impact on the PEOU of mobile payment apps, while perceived ease of use has a positive impact on the PU of mobile payment apps. PEOU also has a direct impact on the perceived service of mobile payment apps.

### IV. RESEARCH HYPOTHESES

This study will examine the following research hypotheses based on the research model shown in Fig. 2.

- H1. PU of mobile payment apps has a direct impact on the continuance intention to use mobile payment apps.
- H2. PEOU of mobile payment apps has a direct impact on the continuance intention to use mobile payment apps.
- H3. Perceived service quality of mobile payment apps has a direct impact on the continuance intention to use mobile payment apps.
- H4. Social influence has a direct impact on the continuance intention to use mobile payment apps.
- H5. Trust in the internet has a direct impact on the continuance intention to use mobile payment apps.
- H6. Internet self-efficacy has a direct impact on the

continuance intention to use mobile payment apps.  
 H7. Relative advantage has a direct impact on the continuance intention to use mobile payment apps.  
 H8. Compatibility has a direct impact on the continuance intention to use mobile payment apps.  
 H9. Complexity has a direct impact on the continuance intention to use mobile payment apps.  
 H10. PEOU of mobile payment apps has a direct impact on the PU of mobile payment apps.  
 H11. PEOU of mobile payment apps has a direct impact on the perceived service quality of mobile payment apps.  
 H12. Internet self-efficacy has a direct impact on the PEOU mobile payment apps.

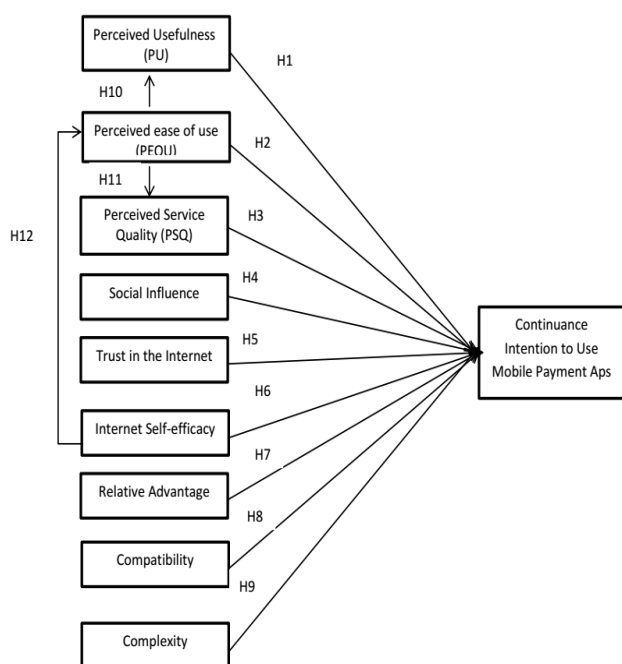


Fig. 2 Proposed Research Model

### V. FUTURE RESEARCH

Future research has to be conducted for the completion of this study. A detailed literature review will be conducted. A research questionnaire instrument would be designed and administered to the targeted population of this study. The instrument will first be pre-tested and piloted before the actual data collection exercise. Pretesting is considered as very important to validate the measurement of phenomena through a survey methodology [27]. It has been extensively discussed in the literature that one of the challenges of research questionnaire design is the phenomenon that targeted respondents often misread or misinterpreted the questions in the instrument [28], [29]. Hence it has been suggested that pretesting is a way of checking that questions in the questionnaire instruments are understood as intended by the potential respondents [30]. In addition pretesting has the potential to reduce visible errors and maximize the response rate of the instruments [31], [32].

One of the crucial steps in the validation of the

instrument is the piloting stage. The piloting may be to test the adequacy of the research instruments, assess the feasibility of the study, design a research protocol and assess whether the research protocols are realistic and can work as expected [33]. It also can be used to determine if the sampling frame and technique to be applied are effective and to assess data analysis techniques to unearth potential challenges [33]. Furthermore piloting can be used as a baseline to convince funding institutions that a proposed research team is and knowledgeable and that the study is feasible and deserves to be funded [33].

### VI. CONCLUSION

Online shopping has brought about a momentous change in the way traditional consumers purchase goods and services. The online shopping environment has provided the consumer with diverse opportunities with regard to deciding which products and services to purchase online. New technologies such as the internet (mobile technology) have become the most convenient method for the consumer to engage in shopping online. The conduct and completion of this study would provide important useful insight into the factors influencing WECHAT users in China to continuously undertake payments online.

### REFERENCES

- [1] TechTarget. Definition e-commerce (electronic commerce or EC) 2016 (cited 2017 26th September, 2017); Available from: <http://searchcio.techtarget.com/definition/e-commerce>.
- [2] Investopedia. Electronic Commerce - e-commerce. 2016 (cited 2017 26th September); Available from: <http://www.investopedia.com/terms/e/e-commerce.asp>.
- [3] Albarq, A. N., Intention to shop online among university students in Jordan. 2006, Graduate School, Universiti Utara Malaysia.
- [4] Wu, S.-I., The relationship between consumer characteristics and attitude toward online shopping. *Marketing Intelligence & Planning*, 2003. 21(1): p. 37-44.
- [5] Cheung, C. M. and M. K. Lee, An integrative model of consumer trust in internet shopping. *ECIS 2003 Proceedings*, 2003: p. 48.
- [6] Goldsmith, R. E. and L. R. Flynn, Psychological and behavioral drivers of online clothing purchase. *Journal of Fashion Marketing and Management: An International Journal*, 2004. 8(1): p. 84-95.
- [7] Agarwal, R. and E. Karahanna, Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS quarterly*, 2000: p. 665-694.
- [8] Lee, J., J. Kim, and J. Y. Moon. What makes Internet users visit cyber stores again? Key design factors for customer loyalty. in *Proceedings of the SIGCHI conference on Human Factors in Computing Systems*. 2000. ACM.
- [9] Torzadeh, G. and G. Dhillon, Measuring factors that influence the success of Internet commerce. *Information Systems Research*, 2002. 13(2): p. 187-204.
- [10] Wang, N., D. Liu, and J. Cheng. Study on the influencing factors of online shopping. in *Proceedings of the 11th Joint Conference on Information Sciences*, Published by Atlantis Press. 2008.
- [11] Cheung, C.M., G.W. Chan, and M. Limayem, A critical review of online consumer behavior: Empirical research. *Journal of electronic commerce in organizations*, 2005. 3(4): p. 1.
- [12] Cotte, J., et al., Pleasure or utility? Time planning style and web usage behaviors. *Journal of interactive marketing*, 2006. 20(1): p. 45-57.
- [13] Davis, F.D., Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 1989: p. 319-340.
- [14] Lee, M. K., C. M. Cheung, and Z. Chen, Acceptance of Internet-based learning medium: the role of extrinsic and intrinsic motivation. *Information & management*, 2005. 42(8): p. 1095-1104.

- [15] Liu, S.-H., H.-L. Liao, and C.-J. Peng, Applying the technology acceptance model and flow theory to online e-learning users' acceptance behavior. *E-learning*, 2005. 4(H6): p. H8.
- [16] Saadé, R., Web-based educational information system for enhanced learning, *EISEL: Student assessment. Journal of Information Technology Education: Research*, 2003. 2(1): p. 267-277.
- [17] .Mensah, I. K., M. Jianing, and D. K. Durrani, Factors Influencing Citizens' Intention to Use E-Government Services: A Case Study of South Korean Students in China. *International Journal of Electronic Government Research (IJEGR)*, 2017. 13(1): p. 14-32.
- [18] Pituch, K. A. and Y.-k. Lee, The influence of system characteristics on e-learning use. *Computers & Education*, 2006. 47(2): p. 222-244.
- [19] Rogers, E., *Diffusion of Innovations* Free Press New York Google Scholar. 1995.
- [20] Eastin, M. S., Diffusion of e-commerce: an analysis of the adoption of four e-commerce activities. *Telematics and informatics*, 2002. 19(3): p. 251-267.
- [21] Fayad, R. and D. Paper, The Technology Acceptance Model E-Commerce Extension: A Conceptual Framework. *Procedia Economics and Finance*, 2015. 26: p. 1000-1006.
- [22] Qiu, L. and D. Li, Applying TAM in B2C E-commerce research: An extended model. *Tsinghua Science & Technology*, 2008. 13(3): p. 265-272.
- [23] Johar, M. G. M. and J. A. A. Awalluddin, The role of technology acceptance model in explaining effect on e-commerce application system. *International Journal of Managing Information Technology*, 2011. 3(3): p. 1-14.
- [24] V, T. K., A Diffusion Theory Perspective on the Adoption of Online Shopping Among Youth in Central Kerala. *International Journal of Innovative Research in Science, Engineering and Technology*, 2014. 3 (10): p. 16688-16694.
- [25] Poorangi, M. M., et al., E-commerce adoption in Malaysian Small and Medium Enterprises Practitioner Firms: A revisit on Rogers' model. *Anais da Academia Brasileira de Ciências*, 2013. 85(4): p. 1593-1604.
- [26] Chen, L. and R. Wang, Trust development and transfer from electronic commerce to social commerce: an empirical investigation. *American Journal of Industrial and Business Management*, 2016. 6(05): p. 568.
- [27] Alaimo, K., Olson, C. M., & Frongillo, E. A. (1999). Importance of cognitive testing for survey items: an example from food security questionnaires. *Journal of nutrition education*, 31(5), 269-275.
- [28] Belson, W. A. (1981). *The design and understanding of survey questions*: Gower Aldershot.
- [29] Hunt, S. D., Sparkman Jr, R. D., & Wilcox, J. B. (1982). The pretest in survey research: Issues and preliminary findings. *Journal of marketing research*, 269-273.
- [30] Hilton, C. E. (2017). The importance of pretesting questionnaires: a field research example of cognitive pretesting the Exercise referral Quality of Life Scale (ER-QLS). *International Journal of Social Research Methodology*, 20(1), 21-34.
- [31] De Leeuw, E. D. (2001). Reducing missing data in surveys: An overview of methods. *Quality & Quantity*, 35(2), 147-160.
- [32] Drennan, J. (2003). Cognitive interviewing: verbal data in the design and pretesting of questionnaires. *Journal of advanced nursing*, 42(1), 57-63.
- [33] Van Teijlingen, E. R., & Hundley, V. (2001b). The importance of pilot studies. *Social research update*, 35(4), 1-4.