

Factors Affecting the E-payment Adoption on E-commerce Platform System in Thailand

Nutthawat Phurkwattanakul¹

Preecha Methavasarakh²

Graduate School of Business and
Advanced Technology Management
Assumption University of Thailand

Email: Nutthawat.phurk@hotmail.com¹

Email: preechamth@au.edu²

Received: August 23, 2021; Revised: November 12, 2021; Accepted: November 30, 2021

ABSTRACT

This research aimed to study factors affecting the adoption of E-commerce Platform System (EPS) in Thailand. Literature review on the topic revealed that the significant factors affecting the adoption of E-commerce Platform were perceived of risk, perceived trust, perceived of usefulness, and perceived ease of use. The researcher used the four factors to design a research tool for this study. The data were collected from 396 respondents. The result of the data analysis showed that only perceived of usefulness and perceived risk were significant factors affecting the adoption of EPS. All four variables, perceived of risk, perceived trust, perceived of usefulness, perceived ease of use, could altogether explain around 72.9% ($R^2 = 0.729$) the adoption of EPS. The customers tended to emphasize the benefit, or usefulness that they would receive from EPS usage. The research findings provided more information regarding the factors affecting the adoption of EPS in Thailand.

Key words: Adoption to use EPS, perceived of risk, perceived trust, perceived of usefulness, perceived ease of use

Introduction

The payment through electronic transaction is well adopted these days in doing financial activities. Electronic payment system (EPS) requires the sender and receiver of the transaction to proceed

with the transaction using a system utilized by a bank, financial service provider. According to the Global Digital Report 2019, Thailand had around 92 million mobile subscribers and 55 million active mobile internet users. The Bank of Thailand reported in 2019 that over 90%

of transactions in Thailand use E-payment including e-commerce transaction. However, JP Morgan report (2019) showed that even if the EPS has been mainly used, cash is still being used in payment channels for E-commerce platform or Cash on Delivery channels. It reaches to a question that how people are affected by EPS. The researcher, therefore, is interested to find out the factors affecting the buyers from adopting electronic payment system. Thailand's e-commerce market is expected to grow by 13% in the next 4 years. And it is indicated that in 2020 at least 44% of Thailand's population have purchased products via online channels. From the literature review, it was found that the main factors that affect the adoption are perceived risk to use EPS, perceived trust to use EPS, and perceived usefulness of EPS, which the researcher aimed to find how these factors affect the intention to use EPS on e-commerce platform.

Research Objectives

1. To study the E-payment adoption on E-commerce Platform in Thailand
2. To study the factors affecting E-payment adoption on E-commerce Platform in Thailand

Scope of research

The target group of this research focused on the users who have been using mobile phones for online activities, living in Thailand, both male and female, and have an experience using EPS. The target group were chosen by using a random sampling technique which prevent target groups from defined membership requirements. The researcher used online-distributed questionnaire and surveys to collect data in Thailand.

Literature review

Electronic Payment System (EPS)

E-payment is linked between individual and cooperation, supports electronic transaction between bank and individual (Briggs and Brooks, 2011; Tan, 2004). Ogedebe and Jacob (2012) stated that electronic payment system is a platform of currency transfer using the internet. EPS also plays an important part in e-commerce as a payment platform when purchasing and selling the products or service on the internet. E-payment system in the research is related to its adoption.

Technology Acceptance Model (TAM)

TAM is used for modeling the user's adoption of technologies. TAM model has 2 main factors, perceived ease of use and perceived usefulness, Figure 1. TAM (1989) mentioned external variables that had an impact on the belief of user towards

the system. Social norm had weak relationship and no impact on user's behavior intention especially when the system is individual usage. TAM is specifically used for examining the factors of user's adoption on technology and system (Chau and Hu, 2002).

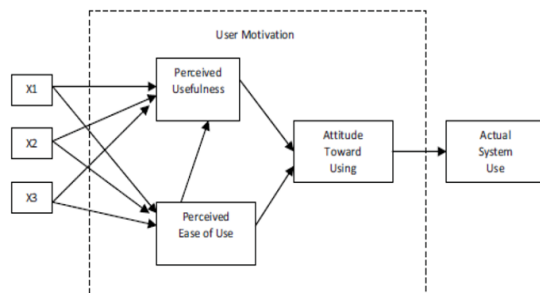


Figure 1 Technology Acceptance Model (Davis, 1986)

E-payment Adoption

E-payment adoption is defined as customer intention to use the electronic payment system (Fusilier et al., 2005). Intention to use e-payment system is stimulated by the simplicity of usage and low on transaction cost when compared with traditional cash transactions and secure to use in terms of privacy of user on e-commerce platform (Senthilmurgan M, 2015).

Perceived Ease of Use

Pikkarainen et al. (2004) stated that the website's interface, graphics, and use of proper images provide easy navigation for users of the bank's website. Abrazhevich (2004) indicated that capable design of the

specific system in terms of user standpoint significantly attracts user's adoption of e-payment system. Previous studies found that technology would be perceived as valuable when it is simple to use and easy to deal with (Legris et al, 2003; Wang and Li, 2012). Guangying Hua (2009) indicated perceived ease of use as action that proceeded effortlessly. When the platform of e-payment system is easy to use, timeless, convenient to use, a customer tends to be prepared to adopt e-payment system. Guangying research (2009) concluded that perceived ease of use has a considerable influence on user adoption of online banking or EPS.

Perceived Risk

Perceived risk is defined as the feeling of uncertainty on something or awareness of the result from a situation that one couldn't control (Noor and Eaw, 2013). Perceived risk is created with uncertainty and increased by awareness of uncontrollable result (Schrack and Dubinsky, 2004). As the e-payment system had been determined as high perceived risk, it will result in decrease customer's intention to use the particular system. Perceived risk has a relationship with customer's adoption to use EPS (P. Pavlou, 2003). Pavlov (2003) stated that as online transaction has high vulnerability, it will raise the perceived

risk and decrease the customer's intention to proceed.

Perceived Usefulness

Consumers tend to create a positive perception of a new technology when they believe it will improve their occupational performance. Perceived usefulness has an impact on the perception of using a specific system because consumers tend to create a positive perception of a new technology when they believe it will improve their occupational performance (Davis, 1989). The perceived usefulness of e-payment system is stated as a transaction experience that resulted in saving time, received financial benefit from usage (Yanli Pei et al., 2015). Ming-Chi Lee (2008) found that perceived usefulness had significant relationship with internet banking's adoption. Usefulness is an important factor for e-payment system usage and adoption (Chou et al, 2004). Kim et al (2010) found that e-payment adoption could mean additional cost in terms of investing in learning time to use the new technology and e-payment system.

Perceived Trust

Trust is defined as a set of beliefs that customers have on a supplier including

Research Framework

Based on literature review, the researcher decided to focus on 4 factors: perceived of

possible action of supplier in the future (Ganesan, 1994). Trust is defined as the personal belief in e-payment system that it will result in meeting the customer's expectations and ability to gain benefit from the customer's intention to use e-payment system for their financial activities (Ali Abdallah Alalwan et al., 2017). Many researches found that perceived trust has significant relationship with customer's adoption of e-payment system (Mehrad and Mohammadi, 2017). However, Said A. Salloum et al. (2019) stated that trust has no significant relationship with the sample's intention to use EPS. Gefen (2000) and Wang et al. (2003) indicated that trust has significant effect on consumer's intention to adopt internet banking and encourages them to proceed with e-commerce transaction. Perceived trust in e-payment is identified as the belief of the user that the transaction will proceed according to their expectation (Tsiakis and Sthephanides, 2005). Trust increases the perception concerning expectation on the EPS and reduces uncertain emotions when the process relates to the risk (Kim et al, 2009).

risk, perceived trust, perceived of usefulness, and perceived ease of use, that

has significant trigger on adoption to use EPS which showed in to model as figure 2.

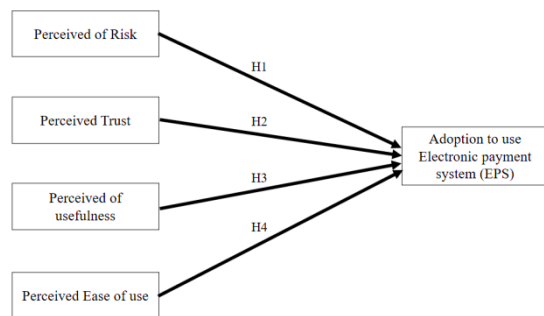


Figure 2 Research Conceptual Framework

Research Hypothesis

Based on the conceptual framework, the researcher utilized four variables and formulated four hypotheses in this research.

H1: Perceived risk has significantly affected adoption to use EPS

H2: Perceived trust has significantly affected adoption to use EPS

H3: Perceived usefulness has significantly affected adoption to use EPS

H4: Perceived ease of use has significantly affected adoption to use EPS

Research Methodology

The study focused on users who have used an E-commerce platform service and made an EPS payment.

Pretesting Questionnaire

The questions had been tested by using Cronbach's alpha and pre-test was conducted on 40 samples to find the alpha

The data from the questionnaires is analyzed using a quantitative methodology in this study. The total number of questionnaires gathered was 396 samples. The researcher selects Cochran's Sample Size Equation for this research due to the unknown population size or EPS user in e-commerce platform, even the bank of Thailand stated that there are around 1.6 million transactions via EPS but it is uncertain for the specific amount of target population, unknown population. To collect data from sample population, the research was conducted by randomly distributing the questionnaires via online form, google form. The researcher collected data in Mid-2021 covering around 1.5 months. As a result, the questionnaires were distributed to Thai respondents who were able to access and complete the survey.

This research has use statistical tools to process the data from the samples so that the primary data that the researcher received will be processed appropriately and accurately. The statistic to be used were descriptive analysis, and regression analysis.

value, if the result of test is above or equal 0.6 it means it can be used in the questionnaire. For the result, Cronbach's Alpha shows these are acceptable with the

result being more than 0.60 which means all questions are consistent and therefore can be applied as the research instrument, the detail is shown in Table 1.

Table 1 The value of reliability analysis			
Variables	Number of Items	Cronbach's Alpha	Reliability
Perceived Risk	6	0.83	Good
Perceived Trust	6	0.92	Excellent
Perceived of Usefulness	6	0.94	Excellent
Perceived ease of use	4	0.706	Acceptable
Adoption to use EPS	6	0.96	Excellent

Results of the Study

There were 396 respondents could be used or answer to the research scope. The demographic questions include gender, age, level of education, Monthly income, and frequency of EPS usage in order to show characteristic of research's sample and general information of samples and variable's question which will show statistics factor like mean, standard deviation, variance, and criteria that most of samples had responded to or what they have perceived of each variable.

Demographic

The sample of the research is comprised mainly of female at 220 samples (55.56%). The majority of the samples' age range is

between 21 – 30 years-old, 270 samples or 68.18% out of total respondents. For Level of education, around 77.27% of respondents have a Bachelor's Degree. For monthly income, it is found that the greatest number of respondents is 168 samples receives a monthly income at range 15,000 - 30,000 THB, or 42.41% of total respondents, and the second group with 147 samples receives a monthly income of over 50,000 THB, or 37.14% of total respondents. Moreover, the greatest number of samples who have a behavior to use EPS at a frequency of 2 – 3 times a week is around 36.86% (146 samples).

The descriptive analysis of research variable showed that most variables are interpreted as "Agree" with maximum score of perceived usefulness at 4.22 and minimum score from perceived ease of use at 3.48, interpreted as "Neutral". For other variables, Adoption to use EPS, perceived risk, and perceived trust are having scores of 4.15, 3.77, and 3.71 respectively. (Table 2)

Table 2 Descriptive analysis of research variables				
Variables	N	Mean	Std.Dev.	Interpretation
Adoption to use EPS	396	4.151	0.626	Agree
Perceived Ease of Use	396	3.487	0.656	Neutral
Perceived of Usefulness	396	4.224	0.640	Agree
Perceived Risk	396	3.737	0.462	Agree

Perceived Trust	396	3.719	0.633	Agree
-----------------	-----	-------	-------	-------

Hypothesis testing

The researcher conducted regression analysis on data and found that the variable has R^2 0.729 meaning that the independent variables significantly affected the dependent variable, adoption

to use EPS, and has a standard error 0.328.

The adjusted R^2 is slightly less than R^2 which means the sample size of this research is adequate and acceptable. (Table 3)

Table 3 Regression analysis Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.854 ^a	0.729	0.726	0.328
a. Predictors: (Constant), Perceived Risk, Perceived usefulness, Perceived ease of use, Perceived Trust				

The coefficient analysis of each variable indicated that only perceived usefulness has significant level below 0.05 and has the highest coefficient value +0.788 with standard error 0.029. For the other variables, Perceived risk had significant level 0.015 and coefficient value +0.130, Perceived trust had significant level 0.254

and coefficient value +0.047. Perceived ease of use had significant level 0.514 and coefficient value -0.017. The Variance Inflation Factors (VIF) were all below 5 and all of the independent variables were not highly correlated with one another, indicating that there were no issues with multicollinearity. (Table 4)

Table 4 Analysis of Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.221	0.177		1.246	0.214		
	Perceived Risk	0.130	0.053	0.096	2.437	0.015	0.449	2.227
	Perceived Trust	0.047	0.041	0.048	1.142	0.254	0.396	2.527
	Perceived of Usefulness	0.788	0.029	0.806	27.420	0.000	0.804	1.244
	Perceived ease of use	-0.017	0.026	-0.018	-0.654	0.514	0.923	1.083
a. Dependent Variable: Adoption to use Electronic Payment System (EPS)								

The hypothesis was tested by the results of the multiple linear regression analysis. The hypothesis testing indicated that

hypotheses 1 and 3 were rejected and hypotheses 2 and 4 failed to reject. The hypothesis 1 was rejected with significant

value 0.015 which below is 0.05 at confidence level 95%. The hypothesis 2 failed to reject due to its significant value of 0.254 which is higher than 0.05 at confidence level 95%. The hypothesis 3 was rejected with significant value 0.000 which is below 0.05 at confidence level 95%. The hypothesis 4 failed to reject due to its significant value of 0.514 which is higher than 0.05 at confidence level 95%. However, to verify the result of first regression analysis, the researcher analyzed the result again (second analysis) by eliminating the variables that the hypothesis failed to reject. The result of second analysis shows that perceived risk

and perceived usefulness affect the adoption to use EPS at R^2 0.727 and less error with adjusted R^2 0.726. The coefficient value of perceive risk and usefulness are +0.167 and +0.803 respectively in the second analysis, which higher than the first analysis. (Table 5 and 6). In summary, the second model which has perceived risk and perceived usefulness as independent variables have significantly affected adoption to use electronic payment system and has a better result in significant value, the unstandardized coefficient Beta, and collinearity statistics value when analyzed the second time.

Table 5 Regression analysis Summary (2nd)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.853 ^a	0.727	0.726	0.328
a. Predictors: (Constant), Perceived of usefulness, Perceived Risk				

Table 6 Analysis of Coefficients^a (2nd)								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.135	0.159		0.852	0.395		
	Perceived Risk	0.167	0.036	0.123	4.604	0.000	0.965	1.036
	Perceived of usefulness	0.803	0.026	0.821	30.635	0.000	0.965	1.036
a. Dependent Variable: Adoption to use EPS								

Discussion and Conclusion

The result of this research showed that perceived usefulness and perceived risk affected adoption to use EPS. Perceived trust and perceived ease of use were found not significantly affected the adoption to use EPS with enough confidence level.

The result that perceived risk affected adoption to use EPS was aligned with the study of P. Pavlou (2003). It was also consistent with the findings of Tsiakis and Sthephanide (2005) in that risk was one of the factors affecting the intention to use electronic payment system. The effect of perceived risk in this research had the

same level as that of Said A. Salloum et al. (2019) indicating that perceived risk has a weak relationship to adoption to use EPS.

Hypothesis 2 failed to reject, so Perceived trust did not significantly affect adoption to use EPS. The significant value of the data showed above confidence level that this research had limits. The result confirmed the study of Said A. Salloum et al. (2019), which stated that trust had no significant relationship to intention to use EPS. Mayer et al. (1995) also indicated that perceived trust had shown different results in many researches. Moreover, the result of perceived trust was found not significantly affected the adoption of EPS, even though it had a high measure of correlation and mean.

Although usefulness was the significant factor that affected adoption to use EPS with high coefficient, +0.788, and significant value at 0.00, so hypothesis 3 was rejected. According to research of Said A. Salloum et al. (2019) in literature review, perceived usefulness had the most significant effect on intention to adopt EPS. The result, however, aligned with the research of Chou et al (2004) that perceived usefulness was a significant factor that affected use of EPS and the EPS adoption. The researcher found that Thailand's population who use EPS on e-commerce platform, tend to focus on the

perceived usefulness the most significant factor affecting the adoption to use EPS which has been proven by many researches in the literature review and statistics tools.

The hypothesis 4 failed to reject, so perceived ease of use has not significantly affected adoption to use EPS. The coefficient of perceived ease of use to adoption to use EPS showed a very weak relationship. Gefen and Straub (2000) showed that perceived ease of use was not affecting the adoption of IT. Only when the main objective for which the IT is installed is closely connected with fundamental IT features, such as ease of use, simplicity of learning, flexibility, and clarity of its interface, can perceived ease of use have a direct impact on IT adoption. Similar to Hua (2009) who stated that perceived ease of use was less affecting to users' perceptions of internet banking. Moreover, Gürler (2016) found that perceived ease of use did not affect the adoption of mobile payment system.

After processing the results of both the first and second analysis, the researcher has configured into a model (Figure 3) and could be determined by the equation as shown below (Figure 4). The samples benefits that they are going to receive from using EPS more than the other factors.

However, Perceived risk still affects consumer decision to the adoption of EPS usage in small factor, which is not strange for online activity since the user has no interface with the service provider, hence, the user is expected to be aware of the risk for any particular online transaction.

Uncertainty generates risk, which is amplified by knowledge of an unpredictable outcome (Schrunk and Dubinsky, 2004). When the customer feel that the EPS is secure or has low level of risk, they tend to adopt EPS usage.

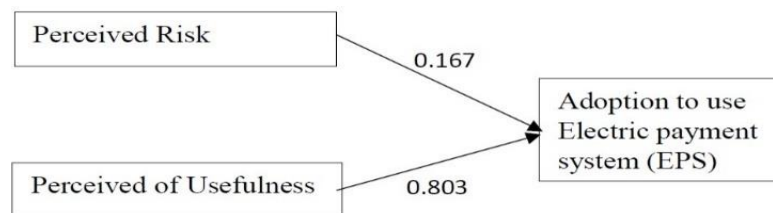


Figure 3 Research Analysis result model

$$\text{Adoption to use Electric payment system equation} = 0.135 + 0.167 (\text{Perceived Risk}) + 0.803 (\text{Perceived of usefulness})$$

Figure 4 Research Equation

Recommendation

For Business, this research will help service providers to understand the factors that affect the adoption of user and how to deal with their customers. The research found that perceived usefulness of the EPS affects most the customer's decision or adoption to use EPS, followed by perceived risk, so the researcher recommends that the service provider to focus on these factors mainly on perceived risk because it has a highest coefficient. Since this research's scope is focused on the population that utilizes EPS in e-commerce platform so the result of this research will benefit the EPS provider and

e-commerce Company. Hence, financial services who are going to engage in online transaction service can also gain benefit from this research. The usefulness of an e-payment system is defined as a transaction experience that saves time and money (Yanli Pei et al., 2015). So, making a faster process of online transaction, eliminating unnecessary steps, increasing customer satisfaction, and time-saving benefit for customers will increase customer usage on EPS. For perceived risk, the researcher recommends that the service provider to increase security of the EPS, reduce chance of cybercrime, and make sure that customers are aware of it. Wendy Ming-Yen et al. (2013) stated that

the more the confidence in e-payment systems, the lesser the perceived risk connected with them.

References

- Ali Abdallah Alalwan, Yogesh K. Dwivedi, Nripendra P. Rana (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *Int. J. Inf. Manage* vol. 37, 99-107.
- Abrazhevich, D. (2004). Electronic Payment Systems: A User-Centered Perspective and Interaction Design. Technische Universiteit Eindhoven, Eindhoven, 24-26.
- Austin Briggs, Laurence Brooks (2011). Electronic payment systems development in a developing country. *The role of institutional arrangements*. *Electron. J. Inf. Syst. Dev. Countries*, 1-16.
- Bank of Thailand (2019, January). Digitalization on Financial Services and Implications for Monetary Policy in Thailand. Retrieved from https://www.bot.or.th/Thai/MonetaryPolicy/EconomicConditions/AAA/DigitalizationonFinancialServicesandMPinThailand_EN_final2.pdf
- Changsu Kim et al. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic commerce research and applications*, 84-95.
- Chou, Y. L. (2004). Understanding M-commerce payment systems through the analytic hierarchy process. *Journal of Business Research*, 1423–1430.
- Davis, F. (1986). A technology acceptance model for empirically testing new end-user information systems: *Theory and results*. Massachusetts, United States: Massachusetts Institute of Technology.
- Davis, F. D. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 982-1003.
- Fusilier Marcelline (2005). An exploration of Student Internet Use in India (the technology acceptance model and the theory of planned behavior). *Journal of Marketing*, 233-246
- Ganesan, S. (1994). Determinants of long-term orientation in buyer-seller relationship. *Journal of Marketing*, 1-19.
- Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega*, 725-737.
- Gürler, Ý. D. (2016). Factors Affecting the Adoption of Mobile Payment Systems: An Empirical Analysis. *Emerging Markets Journal Volume 6 No 1*.
- Hua, and Guangting (2009). An Experimental Investigation of Online Banking Adoption in China. *Journal of Internet Banking and Commerce*.

- JP Morgan (2019). E-commerce Payments Trends: Thailand. Retrieved from <https://www.jpmorgan.com/merchant-services/insights/reports/thailand>
- Kim, D. F. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Information systems research*, 237-257.
- Mayer, R. C. (1995). An integrative model of organizational trust. *Academy of Management Review*, 709-734.
- Ming-Chi Lee. (2008). "Predicting behavioral intention to use online banking", Proceedings of the 19th international conference on information management. Taiwan.
- Mohammad Auwal Kabir, Siti Zabedah Saidin and Aidi Ahmi (2017). Analysis of Factors that Influence Electronic Payment Adoption. *Journal of Engineering and Applied Sciences* 1 2, 6560-6568.
- Noor Raihan Ab Hamid, Aw Yoke Cheng (2013). A Risk Perception Analysis on the use of Electronic Payment Systems by Young Adult. Retrieved from www.apu.edu.my/ E-ISSN: 2224-340226 Issue 1, volume 10, January 2013, 26-36
- Patrick Y.K. Chau, Paul J. Hu (2002). Examining a model of information technology acceptance by individual professionals: An exploratory study. *Journal of Management Information Systems*, 191-229.
- Pavlou, P. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, 101-134.
- Peter Ogedebe, B. P. (2012). E-Payment: Prospects and Challenges in Nigerian Public Sector.
- Pikkarainen, T. P. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet research*, 224-235.
- Said A. Salloum et al. (2019). An Innovative Study of E-Payment Systems Adoption in Higher Education: Theoretical Constructs and Empirical Analysis. *i JIM – Vol. 13, No. 6*, 69-83.
- Schrank, H. and Dubinsky (2004). Effect of brand name on consumers' risk perceptions of online shopping. *Journal of Consumer Behaviour* 4, 40-50.
- Seetharaman, D. R. (2015). E-payments problems and prospects. Retrieved from www.mmu.edu.my/%7Ebmfbl/ ISSN: 1204-5357/2015
- Tsiakis, T. S. (2005). The concept of security and trust in electronic payments. *Computers and Security*, 10-15.
- Wendy Ming-Yen et al. (2013). Factors affecting consumers' perception of electronic payment: an empirical analysis. *Internet Res.*, vol. 23, no. 4, 465–485.

- Yi-Shun Wang et al. (2003). Determinants of user acceptance of Internet banking: an empirical study. *International journal of service industry management*, 501-519.
- Yanli Pei, Shan Wang, Jing Fan, Min Zhang (2015). "An empirical study on the impact of perceived benefit, risk and trust on e-payment adoption: comparing quick pay and union pay in China". *Intelligent Human-Machine Systems and Cybernetics (IHMSC)*, 198-202.