EXPLORING KEY FACTORS ON TECHNOLOGY ACCEPTANCE OF MOBILE PAYMENT USERS IN INDONESIA USING MODIFIED UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) MODEL USE CASE: ABC EASY TAP

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Abstract- Technology has affected all aspects of human lives, including the financial industry. The evolution of financial services has brought to a new era, which is cash-less transaction using electronic money (emoney). Nowadays most of smartphones are equipped with contact less technology such as Near Field Communication (NFC) which is a short distance data transfer wireless communication that enables value exchange such as purchase of goods and services or payment through mobile device (mobile payment). In 2015, ABC easy tap was introduced to the market which is a mobile payment product which is an emoney product that utilized NFC technology for financial transaction. Users can easily just tap on NFC reader to use ABC emoney. This study is conducted aimed to explore factors that determined the market to use the ABC easy tap product using the Unified Theory of Acceptance and Use of Technology Model2 (UTAUT2).

Keywords- E-money; Mobile Payment; Technology Adoption; Consumer Behavior

I. INTRODUCTION

Mobile payments is defined as a combination of payment system with mobile devices and services to provide users with the ability to initiate, authorize and complete a financial transaction over mobile network or wireless communication technology Chandra et.al.,2010 (as cited in Mohan, S. 2014), whilst Lerner, T. 2013 defines Mobile Payment as Payments that are transacted through mobile device.
Lerner further defines Mobile NFC as proximity-payment services that make use of near field communication (NFC) technology and suitably enabled cell phones or smartphones (wallet app, security features, etc.), Lerner,T. 2013

Mobile payment was first introduced in Indonesia, through the introduction of emoney using smart cards in 2005. Banks were among the first to introduce such services followed by Non-Banks emoney providers such as Mobile Network Operators (MNO or Telcos). Now there are 22 licenses issued by the Indonesian Central Bank.

In early 2015, a mobile payment product was introduced to the market and is focusing on the youth and urban lifestyle market. Since its first launched, it has penetrated more than 1 million users with active rate of 19% and growth rate of 49% of the market and is setting a new trend in the youth and urban lifestyle. This study conducted is aimed to explore consumer adoption in using emoney, what factors has influenced the market to use the ABC easy tap.

The theoretical model used is the Unified Theory of Acceptance and Use of Technology Model that was first introduced by Ventakesh et.al in 2003 and was modified in 2012 for consumer products model.

II. MAIN ISSUE

Indonesia has more than 250 million productive populations in which only less than 40% has a bank account and out of the reach of financial services. This has been caused by the lack of the banking network to reach out to the farthest part of Indonesia and the bottom of the Pyramid. Emoney is one of the tools encouraged by the government, through the endorsement from the World Bank in 2010 to decrease the poverty rate in Indonesia through Financial Inclusion. However, until today, the growth of emoney in Indonesia has not been substantially successful. Study conducted an USAID funded program, penetration rate emoney in Indonesia only reached less than 2% of total market and is concentrated in the Capital City, Jakarta.
ABC easy tap, is an electronic payment product enabling the NFC technology that can be used for mobile payment, online shopping payment and P2P transfer. To make payment, customer only needs to tap the cellular phone on EDC machine located in merchants.
The number of ABC easy tap transaction is growing rapidly with the total transaction for the first year of its operation is more than Rp.100 billion (USD 9 million) with the total number of transaction is 3,4 million with average transaction (Average Ticket Size/ATS) per user per month is by Rp 13,000,- (US$ 1) The growth rate exceeds the national emoney growth rate of 13% for the last 10 years. The growth of ABC easy tap number of transactions, by June 2016 has reached 3,6 million transactions, 1,2 milion registered members, active users of 367,008 and percentage of active users to registered users in 32.35%. In contrast, since its first introduced, the emoney industry in Indonesia has only reached less than 2% of the population.

Table 1 eMoney in Indonesia

eMoney by Banks				
Bank	Launched	Subsribers	Active Users	act user/subs
Bank A	2006	10,400,000	2,000,000	19.2%
Bank B	2010	8,090,000	1,200,000	14.8%
Bank C	2011	5,000,000	750,000	15.0%
eMoney by Telcos				
Telco	Released	Subsribers	Active Users	act user/subs
Telco A	2007	7,500,000	500,000	6.7%
Telco B	2009	2,750,000	25,000	0.9%
Telco C	2010	2,000,000	60,000	3.0%
Total		**35,740,000**	**4,535,000**	**13%**

Source : Data collection from various source

Table 1, shows the major emoney operators from Banks and Telcos, totaling 35,7 million subscriber and only 4,5 million or 12,69% active users and only 1,81% out of total Indonesian market.

III. PROBLEM STATEMENT AND STUDY OBJECTIVE

Electronic money in Indonesia has been experiencing a slow growth. In the contrary, since its first launch in middle 2015, the new mobile payment ABC easy tap has a 25% penetration rate, thus this study is exploring what are the key determinants that drives people using ABC eMoney. This study is aimed to identify the key determinant that has encouraged the use of ABC eMoney. Important factors affecting customers to register and to continue to use ABC easy tap regularly will need to be identified so and that will provide lesson learned to other emoney issuers in Indonesia.

IV. LITERATURE RIVIEW

There has been extensive studies conducted to explore technology adoption model, such as Innovation Diffusion Theory (IDT) which was first introduced by Rogers 1962, Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), Technology Adoption Model (TAM) developed by Davies 1986, Model of PC Utilization (MPCU) by Thompson et al. (1991), Theory Planned Behavior (TPB) by Davies 1992, and Unified Theory of Acceptance Use of Technolgy (UTAUT) which was introduced by Ventakesh et.al. 2003.

Table 2. Previous Studies on Mobile Payment

No	Source	Year	Theory	Application	Location
1	Brown et.at	2003	DOI	Mobile Banking	South Africa
2	Wu & Wang	2003	TAM	Mobile Payment	Taiwan
3	Suoranta	2003	DOI	Mobile Banking	Finland
4	Cheong et.al	2004	TAM	Mobile Payment	Korea
5	Zmijewska et.al	2004	UTAUT	Mobile Payment	Australia
6	Dahlberg & Oomi	2007	TAM	Mobile Payment	Finland
7	Chen	2008	TAM	Mobile Payment	USA
8	Goeke & Pousttchi	2010	TAM	Mobile Payment	Germany
9	Kim et.al	2010	UTAUT	Mobile Payment	Korea
10	Puschel et.al	2010	D-TPB	Mobile Banking	Brazil
11	Schierz	2010	TAM	Mobile Payment	Germany
12	Shin	2010	TAM	Mobile Payment	USA
13	Hongxia et.al	2011	UTAUT	Mobile Payment	China
14	Wang & Yi	2012	UTAUT	Mobile Payment	China
15	Leong et.al	2013	UTAUT2	Mobile Paymenet	Malaysia
16	Slade et.al	2014	UTAUT2	Mobile Payment	UK

Source : Mohan, 2014

Table 2 shows the number of studies conducted on mobile payment using technology adoption models. For the purpose of this, model used is Unified Theory of Acceptance and User Of Technology (UTAUT) 2 model which was introduced and developed by Ventakesh (2003&2012) which has been modified in accordance to the need of the study. Modified UTAUT 2 model is used in this study because the model synthesis of eight (8) previous acceptance of technology theory which has been updated, so it is expected to provide clearer illustration of factors determining customer tendency in using eMoney.

UTAUT2 Model can explain 70% of variation in investigating customer behavior intention in adopting technology, this was stated by Ventakesh, et.al 2012 which is adopted in Slade, et.al 2013 p.11, “compared with the original model, produced a substantial improvement in the explained variance of behavioral intention, from 56 per cent to 74 per cent, and also a significant improvement in the explained variances of usage, from 40 per cent to 52 percent. Ventakesh et.al 2012.

V. UNIFIED THEORY OF ACCEPTANCE USE OF TECHNOLOGY (UTAUT)

UTAUT model which is firstly introduced by DR. Visvanath Ventakesh, Michael G Morris, Gordon B Davies, Fred D Davis which is written in a journal entitled, “User Acceptance of Information Technology: Towards a unified view ”Unified theory

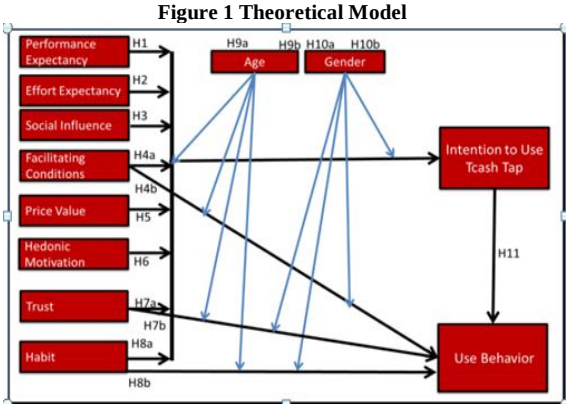
of acceptance and use of technology (UTAUT)" in 2003, is considered to give more comprehensive overview compared to other previous technology adoption models. This is because UTAUT model has synthesized some key variables of 8 (eight) various adopting model into one technology adoption model. In 2012, Ventakesh develops and enriches UTAUT model into UTAUT 2 model in which UTAUT 2 model is very appropriate to study adoption in technology which is directly related to consumer products. As illustrated by Ventakesh, Tong and Xu in MIS Quarterly journal entitled "Consumer Acceptance and Use of Technology :Extending the unified theory of Acceptance and use of Technology" in 2012, Ventakesh, et al. 2012 in which Ventakesh studied the adoption of internet mobile use in Hong Kong as the study object using UTAUT2 model.

VI. RESEARCH METHODOLOGY

The approach used in this research to explore factors affecting ABC easy tap use is technology adoption model using Unified Theory of Acceptance and Use of Technology2 (UTAUT2). UTAUT model is the current technology acceptance theory that summarizes previous acceptance theories and since ABC easy tap is a consumer product, thus UTAUT2 model is used to explain the utilization of technology (Ventakesh, et.al.2012). Some modification is required in the attempt to maintain relevance in the context of ABC easy tap study.

VII. THEORETICAL MODEL

Figure 1 Theoretical Model



Source : Ventakesh et.al 2012 edited

Adopted from Ventakesh, et.al 2012 model, shown in figure 1. Variables that will be use to predict the Intention to use and use behavior of ABC easy tap users are:

Performance Expectancy (PE;, which is the perceived level of benefits and advantages in daily ABC easy tap utilization or perceived usefulness that affect the intention to continue using the technology. Ventakesh states that Performance Expectancy is the key predictor in UTAUT model, Ventakesh et al., 2003. PE variable is moderated by Age and Gender, Ventakesh et al., 2003, Slade et.al. 2014, Mohan 2014.

Effort Expectancy (EE) is the ease of ABC easy tap utilization, this is based on one of ABC easy tap advantage and product statement which are easy, fast and reliable to use. EE variable is moderated by Age and Gender, Ventakesh et al., 2003.

Social Influence (SI) is the influence of surrounding environment to use a product. Social influence factor in using ABC easy tap includes in organization influence which is managerial policy that influence employees to use ABC easy tap, important people in the family circle or other influencing social communities. SI variable is moderated by Age and Gender, Ventakesh et al., 2003.

Price Value (PV) is related to discrepancy perception between the benefit of using a technology with cost (monetary cost) paid to use the technology. Ventakesh et.al 2012:161, stated that the notable differences between the first version of UTAUT compare to the later version, is that costumer will be directly impacted on the price value whereas the first version of UTAUT, utilization of technology was not voluntary in that organization bared all the cost. In the context of consumer product, cost structure will significantly affect technology utilization by costumers.

Facilitating Conditions (FC) which is the customers' perception towards the supporting infrastructure of new technology that is considered to affect the intention of using the new technology, in this case are location of merchant and the availability to make transaction, the EDC machine readiness as well as stability, the availability of customer care service and the easiness to top up ABC easy tap. FC variable is moderated by Age and Gender and has direct determinant toward Use Behavior, Ventakesh, 2013.

Hedonic Motivation (HM) which is a feeling of fun and proudness in using ABC easy tap. As an innovative product with NFC technology, this variables will determined whether or not ABC easy tap utilization can raise feeling of fun and proud. HM variable is moderated by Age and Gender, Ventakesh et.al 2012

Trust (TR) is being added to the UTAUT model in which is at what costumers perceived on the level of security and brand of ABC easy tap. In the study conducted by Yan,H. and Z.Yang 2015 it is stated that Trust factor is the key variable in transactional system involving private and sensitive information transmission. Privacy strongly affects trust and that will affect behavioral intention to make financial transaction.

Habit is defined as how far technology users tend to use the technology automatically based on previous learning process. Habit factor is indicated to have huge potential to explain behavior related to technology, (Limayem et al. 2007 in Ventakesh et.al 2012 : 161). Habit variable is moderated by age and

gender and has direct determinant toward use behavior, Ventakesh 2013

8. RESULT OF THE STUDY

The model was tested using Smart PLS 2.0 software. Convergent validity and discriminant validity is conducted to test the validity of the data. Reliability test was conducted by considering the value of Average Variance Extracted (AVE), Composite Reliability and Cronbachs Alpha of each construct. To meet reliable AVE value, the value recommended is > 0.5, recommended Composite Reliability value is > 0.7 while recommended Cronbachs Alpha value is > 0.6. The summary of Composite Reliability and Cronbachs Alpha is presented in the following table:

Tabel 5 Composite Reliability and Cronbachs Alpha

	Variable	Path Coefficient	T Statistics	Level of Significant	t-Table	Results
1	Habit -> IU	0.3729	10.142	95%	1,648	Signifikan
2	Trust -> IU	0.2268	4.945	95%	1,648	Signifikan
3	PV -> IU	0.1628	3.320	95%	1,648	Signifikan
4	HM -> IU	0.0772	1.844	95%	1,648	Signifikan
5	PE -> IU	0.0996	1.988	95%	1,648	Signifikan
6	FC -> IU	0.0581	1.327	90%	1,283	Signifikan
7	EE -> IU	0.0451	0.837	95%	1,648	NOT Signifikan
8	SI -> IU	0.0150	0.325	95%	1,648	NOT Signifikan
1	Habit -> UB	0.3237	6.534583	95%	1,648	Signifikan
2	FC -> UB	0.2075	5.268545	95%	1,648	Signifikan
3	Trust -> UB	0.1297	2.496251	95%	1,648	Signifikan
1	IU -> UB	0.3101	5.674334	95%	1,648	Signifikan

Based on the table above, it can be concluded that all indicators and constructs used in this study are valid and reliable.

Table 6. Path Analysis

	AVE	Composite Reliability	Cronbachs Alpha	Result
Performance Expectancy	0.658769	0.885255	0.827244	Reliabel
Effort Expectancy	0.742613	0.896404	0.82657	Reliabel
Social Influence	0.76775	0.908378	0.848668	Reliabel
Facilitating Condition	0.590701	0.896013	0.859874	Reliabel
Price Value	0.663046	0.854891	0.744964	Reliabel
Hedonic Motivation	0.741561	0.895894	0.825579	Reliabel
Trust	0.676411	0.892784	0.838973	Reliabel
Habit	0.740877	0.895575	0.825346	Reliabel
Intention to Use	0.724696	0.912964	0.871697	Reliabel
Use Behavior	0.664339	0.907891	0.872475	Reliabel

The result of Inner Model test using path analysis found that from the twelve relationship between exogenous latent construct and endogen latent construct in path coefficient and t-statistics value table of study construct, found that all variables are positive and that only Effort Expectancy and Social Influence has now value of T-Stats and are considered as Not Significant.

In this study, R^2 value obtained on Intention to Use and Use Behavior constructs are as follows:

Table 7. R^2 value

	R Square
Intention to Use	0,757
Use Behavior	0,731

Based on the table above, it is found that R^2 value on Intention to Use construct is 0.757 that indicates that Intention to Use is affected by 75.7% by Effort Expectancy, Facilitating Conditions, Habit, Hedonic Motivation, Performance Expectancy, Price Value, Social Influence, and Trust, while by 24.3% are affected by other factors. For Use Behavior construct, R^2 value by 0.731 indicates that 73.1% of Use behavior is affected by Facilitating Conditions, Habit, Intention to Use and Trust, while the remaining is affected by other factors out of this study.Goodness of Fit used in this study is using Tenenhaus, 2004 GoF, ie :

$$GOF = \sqrt{(Com\ X\ R2)} = \sqrt{(0.744 * 0.697)} = 0.720$$

Thus, according to Tenenhaus, et.al 2004, GoF index, this study is meaning that the model is able to take into account 72% of the achievable fit.

9.1 The Effect of Moderator Variable

9.1.1 The Effect of Gender Moderator Variable

The examination by involving gender moderator variable was conducted by considering gender influence involving “male” and “female” categories. Based on the Examination Result of gender group moderation t-value, it is found that t-value for the effect of Facilitating Condition against Intention to Use > 1.65 results α = 5%. Therefore, it can be concluded that gender is moderator of the effect of Facilitating Condition against Intention to Use. If two gender groups are compared based on path coefficient value, it is found that male group effect is higher than female group. This means that for intention to use ABC eMoney, male gender tends to be influenced by Facilitating Condition variable compared to female gender.

9.1.2 The Effect of Age Moderator Variable

The examination of age moderator variable was conducted by following previously listed steps which is by dividing group based on moderation, in this case is young age ranging from 15-35 years old and elderly ranging from 36-65 years old. Based on the examination result on age group moderation t-value, it is found that all variables have t-value < 1.65 have α = 5%. Therefore, it can be found that age is not the moderator.

CONCLUSION

Based on the results of the study. It can be concluded as follows:

Out of eight (8) variables, six (6) has a positive and significant determinant to Intention to use. The strongest predictor towards Intention to Use is influenced by variables Habit , Price Value ,Trust, Hedonic Motivation, Facilitating Condition and Performance Expectancy. Effort Expectancy and Social Influence has positive effects but not significant. Meanwhile use behavior is determined by variables Habit, Facilitating Condition and Trust.

Thus, this means that the key determinant for the success of ABC easy tap intention to use is determined mainly by Habit which is driven by Price Value through discounted prices at merchants, and Trust, it turns out that brand image of the operator ABC is a strong influencer, in that people feel safe to do financial transaction when they know that a large

and entrusted company is behind the infrastructure of the ABC easy tap product. Trust also has a positive and significant effect on use behavior, which supports Yan,H. and Z.Yang (2015) and Slade et.al (2013). Users believe that an entrusted company behind the infrastructure of the product and security for private information is an important factor.

Current users also have a sense of proud of using the product, as Hedonic Motivation is strongly influence the intention to use ABC easy tap. As Ventakesh, et.al (2012) strongly suggested that Hedonic Motivation is a strong predictor to consumer products. Nevertheless, issuer of ABC easy tap should take notice on maintaining the infrastructure and equipment such as NFC reader, availability and easiness of customer service and most importantly are availability of the merchants. In support to Dahlberg et.al 2006 study, that Merchants play an important role for the success of mobile payment implementation, as Facilitating Condition has a direct and strong correlation to Use Behavior together with Habit and Trust. The more merchants and easier to find merchants, the more people are utilizing the products and the more people are happy to use and tell to others about ABC easy tap, thus creates a viral social influence.

The study also found that men are more concern on the facilities behind the product such as help desks, information concerning the use of ABC easy cash such as guide book and the availability of merchants.

REFERENCES

[1]. Dahlberg,T. J.Guo and J.Ondrus., (2015) "A Critical review of mobile payment research." Helsinsky, Electronic Research and Application Journal Vol 14, Issue 5

[2]. Dahlberg. T, N.Malaat, J.Ondrus, A.Zmijewska (2006) Mobile Payment Market & Research : Past,Present & Future, Sprout Proceeding of Helsinky Mobility Roundtable working paper on Information

[3]. EY & HM Treasury UK., (2016) Fintech on the cutting edge : an evaluation of the international fintech sector. Report Study .UK., Ernst&Young commissioned by UK Economic Secretary to the Treasury, UK.

[4]. Flaming, M, P.Klaus and S.Stefan, (2009, June), Diagnostic report on the Legal and Regulatory Environment for Branchless Banking in Indonesia, Jakarta Indonesia CGAP-IFC-GTZ

[5]. Hair, Joseph F Jr., W.C.Black., B.J.Babin. and R E.Anderson., (2010), Multivariate Data Analysis: a Global Perspective 5th ed., Pearson Prentice Hall. New Jersey

[6]. Indrawati, (2015), Metode Penelitian Manajemen dan Bisnis : Konvergensi teknologi komunikasi dan informasi, Bandung: Refika Aditama

[7]. Jiajun K.C, K. Adams (2005) User Acceptance of Mobile Payment : a Theoritical Model for Mobile Payment, Proceedings of the fifth International Conference on Electronic Business, Hong Kong,. University of Portsmouth, UK p.619-624

[8]. Lerner, T. (2013). Mobile Payment. Springer Fachmedien Wiesbaden, Mainz, Germany

[9]. Malaat.N, (2006) Exploring consumer adoption of mobile payment – a Qualitative research. Helsinki School of Economic. Finland

[10]. Miliani, Lani.,M.S.Purwanegara dan M.T.Indriani, (2013) Adoption behavior of emoney usage, Institute of Technology Bandung, School of Business and Management, Indonesia. Information Management and Business Review vol.5, no.7 (ISSN 2220-3796) pp.369-378,

[11]. Mohan, S, (2014), Consumer acceptance towards using NFC mobile payments, Master Thesis University of Amsterdam

[12]. Pertawijaya, I. (2015) Analisis komparatif Mobile Technology Acceptance Model pada aplikasi Telkom TMoney dan Mandiri eCash, Skripsi Sarjana Telkom University. Bandung

[13]. PéniCaud C, and K.Arunjay, GSMA, Study Report 2013 State of the Industry, Mobile Financial Services For the Unbanked

[14]. Sekaran, U. and R.Bogie (2010) Research Methods for Business : A Skill building approach.4th ed. 2003 dan 5th ed. United Kingdom : Willey

[15]. Slade, E., M.Williams and Y.Dwivdei., (2013), Extending UTAUT2 to explore consumer adoption of mobile payments, UK Academy for Information System Conference Proceedings 2013 paper 36. Associate for Information Systems. AIS Electronic Library http://aisel.aisnet.org/ukais2013/36

[16]. Tenenhaus,M., Amato. S (2004), A global Goodness–of–Fit index for PLS structuralequation modeling, HEC School of Management, France

[17]. Ventakesh,V. M.G Morris, G.B.Davies and F.D.Davies. (2003) User Acceptance of Information Technology: Toward a unified view MIS Quarterly Vol.27 no.3

[18]. Ventakesh V, J.J.L,Thong, X.Xu (2012) Consumer Acceptance and Use of Information Technology :Extending the Unified Theory of Acceptance and Use of Technology, MIS Quarterly Vol.36 no.1

[19]. World Bank Research (2012, Mar), KKSK Bank Indonesia

[20]. Yan,H. and Z.Yang (2015) Examining Mobile Payment User Adoption from the perspective of Trust, International Journal of u-and e-Service. Science and Technology Vol.8. No.1 (2015) pp.117-130 http://dx.doi.org/10.14257/ijunesst.2015.8.1.11

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