

# FACTORS AFFECTING THE ADOPTION OF ELECTRONIC MONEY USING TECHNOLOGY ACCEPTANCE MODEL AND THEORY OF PLANNED BEHAVIOR

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## **Abstract**

*With the rapid growth of information technology, electronic money has played an important and central role in the e-payment. Development of electronic money is able to create a trend less cash society, which is a society's behavior using non-cash transactions by utilizing the simplicity offered through electronic transactions. The purpose of this research is to determine the factors affecting the intention to use electronic money. We designed a questionnaire and used it to survey a simple random sampling of people who use of e-money in DKI Jakarta. The actual samples used for the study are 125 respondents. We analyzed the data using Structured Equation Modeling to evaluate the strength of the hypothesized effects. The result of the analysis showed that perceived ease of use has no significant effect on attitudes towards the use of e-money. Perceived ease of use has a significant effect on the perceived usefulness of e-money. Perceived usefulness has no significant effect on the intention to use e-money. Perceived usefulness has a significant effect on attitudes towards the use of e-money. Attitude has a significant effect on the intention to use e-money. Subjective norm has a significant effect on the intention to use e-money. Perceived behavioral control has no significant effect on the intention to use e-money.*

**Keywords:** *electronic money, technology acceptance model, theory of planned behavior*

## **INTRODUCTION**

With the rapid growth of information technology, electronic money has played an important and central role in the e-payment. Development of electronic money is able to create a trend less cash society, which is a society's behavior using non-cash transaction by utilizing the simplicity offered through electronic transactions. According to the data from Bank Indonesia, the use of e-money in Indonesia continues to increase. Bank

Indonesia recorded electronic money transaction value reached Rp2.9 trillion in 2013. The number of transaction increased by 97% (year-on-year) from the year 2012 which recorded at Rp1.4 trillion. While the use of electronic money transaction volume also increased to 9.62 million transactions in 2013. This volume increased 68% from the year 2012 as many as 5.72 million transactions (can be seen in Figure 1.).

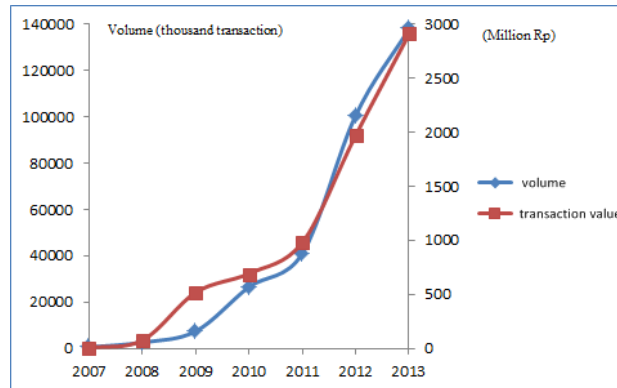


Figure 1. The number and value of electronic money transactions  
Source: data processed, Bank Indonesia

In the development of electronic payment instruments, there are still obstacles in particular on the readiness of society in the era of a cashless society. Low awareness and public trust in the ease offered to use e-money is still lacking so people still prefer to use cash as a payment instrument. Indonesian is still a cash society which holding money is still a habit. Thus, public trust must still be improved and maintained so that the use of electronic money can continue to grow. In this case, the people in Indonesia are still low knowledge and awareness on electronic money because introduction and understanding of electronic money have not been implemented optimally, and unpreparedness of regulators and issuers in support of electronic money as a new practical and safe payment instrument.

Technology Acceptance Model (TAM) is the widely used model in describing the user acceptance of new technology. One of the most utilized model in studying information system acceptance is the Technology Acceptance Model (TAM) (Davis, 1989), which system use (actual behavior) is

determined by perceived usefulness (PU) and perceived ease of use (PEOU) relating to the attitude toward using (A) that relates to intention to use (ITU). Before accepting electronic money services, users should be aware of benefits, security, and risk associated with it, which are important. In this regard, we use the theory of planned behavior (TPB) with the addition of two extra variables namely subjective norm (SN) and the perceived of behavioral control (PBC) to the model to provide a more comprehensive theoretical perspective of user technology acceptance in the context of electronic money.

Based on the explanation above, this research tested “Factors Affecting the Adoption of Electronic Money Using Technology Acceptance Model and Theory of Planned Behavior”.

## LITERATURE REVIEW

User acceptance of information technology system is defined as the demonstrable willingness within the organization to employ information

technology for the tasks it is designed to support. It has been noted that users' attitudes toward and acceptance of a new information system have a critical impact on successful information systems adoption (Davis, 1989; Venkatesh and Davis, 1996). If users are not willing to accept the information system, it will not bring full benefits to the organization (Davis, 1993; Venkatesh and Davis, 1996). The more accepting of a new information system the users are, the more willing they are to make changes in their practices and use their time and effort to actually start using the new information system (Succi and Walter, 1999).

#### **Technology Acceptance Model (TAM)**

Theory Acceptance Model (TAM) is an adaptation from the Theory of Reasoned Action Model (TRA) by Fishbein and Ajzen (1975) and has been specifically tailored for modeling user information system acceptance (Davis et al, 1989). The model referred to as the Technology Acceptance Model (TAM) is an information systems model that shows how users come to accept and use technology. The model suggests that when users are presented with new technology, a number of factors influence their decision about how and when they will use it, notably: Perceived usefulness (PU) and Perceived ease of use (PEOU) and their attitudes towards the use of the system. Until now, TAM is one of the most influential research models in studying the determinants of IT usage (Gefen, 2002) and has proven to be a very useful theoretical model in helping

to understand and explain the behavior of users in the implementation of information systems (Legris et.al, 2003).

#### **Theory of Reasoned Action Model (TRA)**

The Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1975) is to explain and predict people's behavior in a specific situation. According to TRA, a person's actual behavior is driven by the intention to perform the behavior. Davis, et al (1989) extended the Theory Reasoned of Action (TRA) with TAM to discover synthesizing elements of the two models in order to arrive at a more complete view of the determinants of user acceptance. In the Theory of Reasoned Action, there are three conditions in which the intention of an individual can accurately predict the behavior. First, the intention and behavior measures correspond in the specificity of action, target, context and time frame. Second, intention and behavior do not change in the interval between assessment of intention and assessment of behavior. Finally, the behavior in question is under the individual's volitional control, that is, he/she can decide at will to perform or not perform (Fishbein and Ajzen 1980).

#### **Theory of Planned Behavior (TPB)**

The Theory of Planned Behavior (TPB) is another model that Ajzen (1991) extended, integrated and compared the TAM model to determine which model is most helpful in understanding the technology usage. Thus the

Theory of Planned Behavior was developed incorporating behavioral control factors in predicting behavior. It posits that most intended behaviors are subject to some uncertainty and that the success in performing behavior depends not only on factors that may interfere with behavior control.

The theory of Planned Behavior provides a conceptual framework to predict human behavior based on three categories of belief: behavior beliefs, normative beliefs and control beliefs. These three categories of beliefs support the major constructs of the theory. Behavioral beliefs are the benefits or negative consequences of the target behavior. Behavioral beliefs are the guiding principles to attitude toward behavior. Normative beliefs are the expectations that important people in one's life have concerning a behavior. Normative beliefs are directly responsible for an individual's subjective norms toward behavior. Control beliefs are the possible obstacles that would hinder one from performing a behavior. Control beliefs are responsible for perceived behavioral control over a behavior. Behavioral intention is assumed to be the direct antecedent to actual behavior.

## **Hypothesis**

### **Perceived Ease of Use**

H1: Perceived Ease of Use (PEOU) has a positive effect on Attitude (A) toward the use of e-money.

H2: Perceived ease of use (PEOU) has a positive effect on perceived usefulness (PU) e-money.

### **Perceived Usefulness**

H3: Perceived usefulness (PU) has a positive effect on the intention to use e-money.

H4: Perceived Usefulness (PU) has a positive effect on Attitude (A) toward the use of e-money.

### **Attitude**

H5: Attitude (A) has a positive effect on the intention to use e-money.

### **Subjective Norms**

H6: Subjective norm (SN) has a positive effect on the intention to use e-money.

### **Perceived Behavioral Control**

H7: Perceived behavioral control (PBC) has a positive effect on the intention to use e-money.

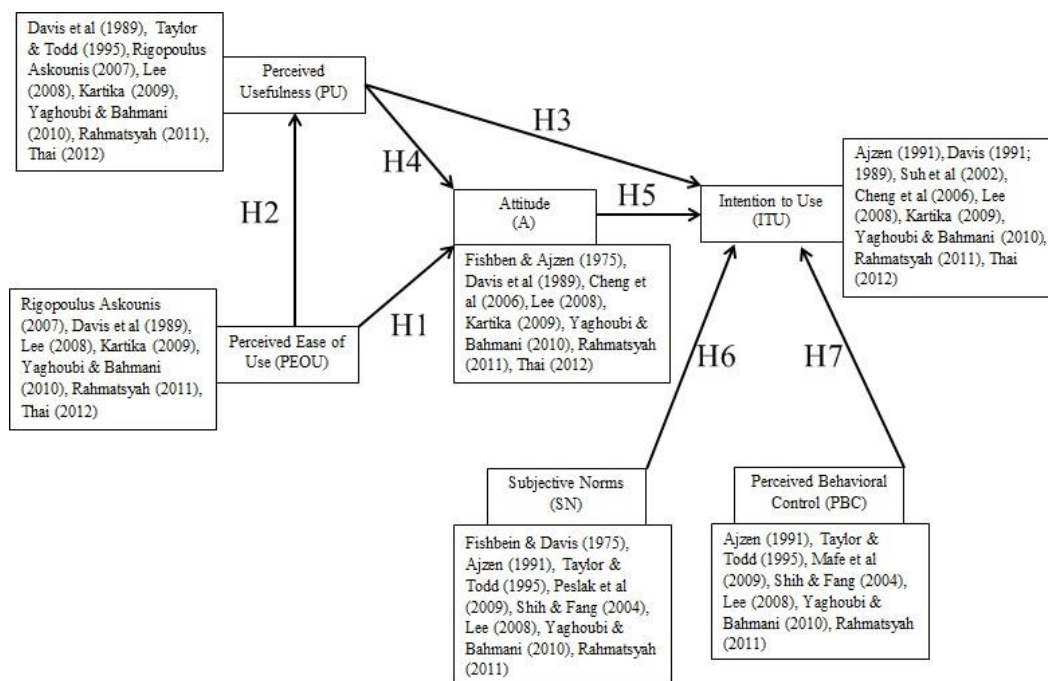


Figure 2. Research Framework

## RESEARCH METHOD

### Population and Sampling

The population in this research is the people who use electronic money (e-money) in DKI Jakarta. The sampling method used in this research is simple random sampling. The minimum number of samples in this research is 115 respondents, the sample obtained from the minimum requirement which is five times the number of main questions in the questionnaire (Ferdinand, 2002). According to Ferdinand (2002), the number of representative samples for the Structural Equation Model (SEM) is between 100 and 200. Then the samples used in this research are 125 respondents.

### Type and Source of Data

Type of data in this research is quantitative data sourced from primary data. Primary data will be obtained from the respondent's answers on the list of questionnaires distributed directly or through Internet media to respondents. Moreover, this research also uses secondary data which are a collection of related theories in research, documents or journals, references books, company reports and other sources of information related to this research.

### Data Collecting Method

Data collecting method in this research was conducted using a survey method that is a questionnaire conducted by giving a few questions and written statements to the

respondent (Sugiyono, 2008). Dissemination and collection of data conducted directly to respondents in public places predominant using of electronic money as micropayment transactions such as train stations, busway stop, and retail store and via the Internet.

### **Analysis Method**

Analysis method in this research is testing data obtained from the respondents that have been collected and analyzed using analysis tools SEM (Structural Equation Model) with using AMOS (Analysis of Moment Structure) program.

## **RESULT AND DISCUSSION**

### **Measurement Models with Confirmatory Factor Analysis**

Measurement model with a confirmatory factor analysis of each construct is used to check unidimensionality from indicators that describe a factor or a variable. The confirmatory analysis uses a single

measurement model, that some indicators are used to define a latent variable.

The results of confirmatory factor analysis calculations to each of variables such as perceived usefulness, perceived ease of use, perceived behavioral control, subjective norm, attitude toward using, and intention to use indicates that the value of each construct forming latent variables showed good results, which is the value of  $CR > 2$  or with probability less than 0.05. With these results, it can be said that all of the construct forming latent variables have shown unidimensionality.

### **Analysis of Structural Equation Modeling (SEM)**

The subsequent analysis is full model Structural Equation Modeling (SEM), after an analysis of the level of unidimensionality from construct forming latent variables are tested by confirmatory factor analysis. The results of the analysis of data processing for a full model of SEM can be seen in Figure 3 as follow:

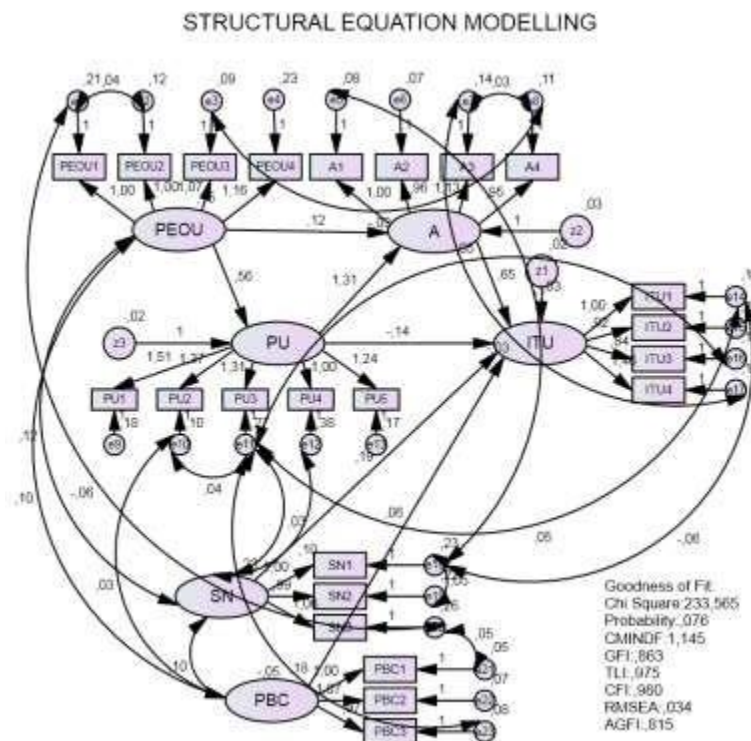


Figure 3. Structural Equation Modelling

**Table 1. Goodness of Fit of Structural Equation Modeling (SEM)**

Criteria of Goodness of Fit	Cut-off	Result	Information
Value			
X <sup>2</sup> Chi Square Statistic	<238,322;	233,565	Fit
df=204			
Significanced Probability	≥0,05	0,076	Fit
CMIN/DF	≤2,00	1,145	Fit
GFI	≥0,90	0,863	Marginal
AGFI	≥0,90	0,815	Marginal
TLI	≥0,95	0,975	Fit
CFI	≥0,95	0,980	Fit
RMSEA	≤0,08	0,034	Fit

Source: data processed

This result indicates that the model used can be accepted as a good structural equation

model although GFI and AGFI are marginally acceptable. However, overall measurement

Chi-square, probability, CMIN / DF, TLI, CFI, and RMSEA are within the range of expected values. Thus Suitability test of SEM models already qualified acceptance.

### Hypothesis Testing

While the relationship exogenous variables on

the endogenous variables to see the estimated value of the standardized regression weight as in Table 4. While the relationship exogenous variables on the endogenous variables to see the estimated value of the standardized regression weight as in Table 2 as follows:

**Table 2. Standardized regression weights**

			Estimate
PU	<---	PEOU	,814
A	<---	PEOU	,110
A	<---	PU	,828
ITU	<---	SN	,268
ITU	<---	PU	-,108
ITU	<---	A	,810
ITU	<---	PBC	,082

Source: data processed, 2015

**Table 3. Squared multiple correlations**

	Estimate
PU	,662
A	,847
ITU	,852

Source: data processed, 2015

Structural equation model based on these results can be written as follows:

$$ITU = 0,810A - 108PU + 0,268SN +$$

$$082PBC + z1 A = 0,828PU + 0,110PEOU + z2$$

$$PU = 0,814PEOU + z3$$

**Table 4. Regression Weight**

			Estimate	S.E.	C.R.	P	Description
A	<---	PEOU	0,119	0,182	0,656	0,512	Rejected
PU	<---	PEOU	0,556	0,147	3,782	***	Accepted
ITU	<---	PU	-0,137	0,441	-0,31	0,757	Rejected



A	<---	PU	1,31	0,401	3,27	0,001	Accepted
ITU	<---	A	0,646	0,276	2,337	0,019	Accepted
ITU	<---	SN	0,186	0,075	2,499	0,012	Accepted
ITU	<---	PBC	0,065	0,067	0,962	0,336	Rejected

Source: data processed

The first hypothesis proposed in this research that perceived ease of use would predict attitude toward the use of e-money has no significant effect. Parameters estimation contained in Table 2 showed a positive correlation of 0.110 with the C.R. value 1,656 and probability value of 0.512 which is greater than 0.05. The path for hypothesis 2 in Table 2 showed a positive correlation of 0.814. With C.R. value 3.782 and probability value less than 0.05 indicated with an asterisk (\*\*\*), it can be concluded that the second hypothesis is accepted.

The third and fourth Hypotheses proposed that perceived usefulness would be a positive predictor of intention (Hypothesis 3) and attitude toward the use of e-money (Hypothesis 4). The path for hypothesis 3 on parameters estimation contained in Table 2 showed a negative correlation of -0.108 with C.R. value - 0.310, and a probability value of 0.757 which is greater than 0.05. It can be concluded that the third hypothesis is rejected. While in hypothesis 4 was accepted. Based on the estimation of the parameters contained in Table 2 showed a positive correlation of 0.828. In Table 4. C.R. value 3.270, the value is above a critical value 2 with a probability

value less than 0.05 is 0.001.

The fifth hypothesis in this research proposed that the effect attitude has a positive effect on the intention to use e-money. Based on the estimation of the parameters contained in Table 2 showed a positive correlation of 0.810. In Table 4. C.R. value 2.337, the value is above a critical value 2 with a probability value less than 0.05 is 0.019. Therefore, hypothesis 5 was accepted. The sixth hypothesis proposed that subjective norms would be a positive predictor of intention to use e-money. Based on the estimation of the parameters contained in Table 2 showed a positive correlation of 0.268. In Table 4. C.R. value 2.499, the value is above a critical value 2 with a probability value less than 0.05 is 0.012. Therefore, hypothesis 6 was accepted. The sixth hypothesis proposed that perceived would be a positive predictor of intention to use e-money. Based on the parameters estimation contained in Table 2 showed a positive correlation of 0.082. In Table 4. C.R. value 0.962, the value is below the critical value is 2 with a probability value of 0.336 which is greater than 0.05. Therefore, hypothesis 7 was rejected.

**Table 5. Direct, Indirect and Total Effect**

Perceived Usefulness			Attitude			Intention		
Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
0,814	-	0,814	0,11	0,674	0,784	-	0,547	0,547
-	-	-	0,828		0,828	-0,108	0,671	0,563
-	-	-	-	-	-	0,81		0,81
-	-	-	-	-	-	0,268		0,268
-	-	-	-	-	-	0,082		0,082

Source: data processed, 2015

The results show that the intention to use electronic money is primarily and positively affected by attitude with the total effect of 0,81 and subjective norms with the total effect of 0,26. This implies that the attitude is the most important predictor of the intention to use e-money. The emergence of intention to use e-money affected the emergence of customer initial attitude toward the service. It can be concluded that of this research the attitude is a determinant factor that encourages a person to use e-money. The results are consistent with research by Lee (2008), Yaghoubi and Bahmani (2010), Rahmatsyah (2011) and Tsai (2012) which states that there is a relationship between attitude on the intention to use e-money.

Perceived usefulness also has a significant impact and appears to be the second determinant of a consumer's attention through attitude to adopt electronic money. This result describes that the respondent's attitudes toward the use of e-money are significantly affected by the respondent who has perceived usefulness. Consumers feel the usefulness of

e-money when making a payment process faster and more practical than cash, the favorable consumer attitudes on the use of e-money would be created. This result is similar to the finding reported in Taylor and Todd (1995), which indicated that perceived usefulness has an indirect effect on behavioral intentions toward system use. However, perceived usefulness has no direct effect on the intention to use e-money. Descriptively, the lack of effect of perceived usefulness on the intention to use e-money related to the lack of confident of respondents to the usefulness of e-money. The results it can be concluded that the level of perceived usefulness of e-money does not influence their intention to use e-money. These results support the research conducted by Kartika (2009).

Moreover, Perceived ease of use has a significant effect on perceived usefulness. This result describes that the perceived usefulness is significantly affected by perceived ease of use of e-money of respondents. According to Davis (1989), the simplicity of a system can improve the

performance and technology can be perceived as more useful if it is easier to use. In this case, consumers have easy to use e-money, so they get perceived usefulness in making the payment process faster and more practical than cash. The results are consistent with research by Lee (2008), Yaghoubi and Bahmmani (2010) and Rahmatsyah (2011) which states that the perceived ease of use has a significant effect on perceived usefulness of e-money.

Perceived ease of use does not have a direct impact on intention to use, although it affects the perceived usefulness, which in turn leads to greater acceptance of electronic money. But, perceived ease of use has no significant effect on the attitude of the respondents in the use of e-money. Rejection of this hypothesis related to the tendency of respondents who have an equal perception of perceived ease of use and attitude variable, this results lead to inconsistencies effect of perceived ease of use variable on the attitude of the customer for the use of e-money. The results are consistent with research by Rahmatsyah (2011), Kartika (2009) and Tsai (201) which states that the perceived ease of use has no significant effect on the attitude of the respondents in the use of e-money.

Subjective norms also have a significant effect on the intention to use electronic money. The results of this research indicate that one's intention to use e-money is also affected by the opinions of the people around them. Venkatesh and Davis (2000) reason that the relationship between subjective norm and

behavioral intention/perceived usefulness will be weaker over time. It is believed that people must rely on other people's opinions when they form initial beliefs or intentions toward a system. The results are consistent with research by Lee (2008), Yaghoubi and Bahmani (2010), and Rahmatsyah (2011). But the perceived behavioral control has no significant effect on the intention to use electronic money. In this case, the respondents felt not to have the resources or the opportunity to make use of e-money transactions. This can be seen from how often respondents use e-money as a payment instrument, the majority of respondents answered "uncertain" (see Graph 4.6.), the respondent does not require resources or the ability to use e-money.

## **CONCLUSION NAD SUGGESTION**

Based on the analysis and research, conclusions from the analysis of data and information in this research as follows:

1. The factors that significantly affect the intention to use e-money are subjective norms and attitude towards the behavior. This implies that the attitude is the most important predictor of the intention to use e-money
2. Perceived ease of use has no significant effect on attitudes towards the use of e-money
3. Perceived ease of use has a significant effect on the perceived usefulness of e-money

4. Perceived usefulness has no significant effect on the intention to use e-money
5. Perceived usefulness has a significant effect on attitudes towards the use of e-money
6. Attitude has a significant effect on the intention to use e-money
7. Subjective norm has a significant effect on the intention to use e-money
8. Perceived behavioral control has no significant effect on the intention to use e-money

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