

## **ASSESING CUSTOMER ACCEPTANCE TOWARD INTENTION TO USE E-TOLL CARD USING TECHNOLOGY ACCEPTANCE MODEL (TAM)**

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*Abstract. At this time, the utilization of Electronic payment has become one of the most frequently used as the payment method. Electronic payment give the benefit of ease and convenience transaction for the customer. In Indonesia, cashless payment reach into 31% from all consumer method and Indonesia classified as the country just begun to move into electronic money. This condition supported by government policy to diminish cash transaction by using electronic payment. Electronic Toll Card as the product of electronic payment applied in transportation sector. However, at this time, most of toll road user still use cash payment. The purpose of this research is to assessing the toll road user acceptance toward intention to use of electronic toll card. The consumer acceptance is important aspect to make the consumer using the product. In this research, Technology Acceptance Model use as the research framework to understand consumer acceptance. The research was using 5 main construct including self-efficacy, perceive usefulness, perceive ease of use, attitude toward use, and intention to use. The construct was based on the previous research of TAM and electronic payment. The results of this research shows all of the variables are significant relationship between each of variable with significant value is 0.000. Perceive usefulness is strongest variable to affect intention to use which account 0.598.*

*Keywords: Consumer behavior, Intention to use, Technology Acceptance Model.*

### **Background**

In Indonesia, caseless payment reaches into 31% of the value of all consumer payment. Looking from share indicator, Indonesia described as "Inception" which mean the country just begun to move away from cash into electronic money (MasterCard, 2013). Electronic Money (E-Money) in Indonesia become one of financial tool supporting Less Cash Society (LCS) since 2006. Bank Indonesia official launched National Cashless Movement at 14 August 2014 with purpose to encourage people to diminish cash transaction by using electronic money (Gerakan Nasional Non Tunai, 2015). In this time with development of technology, Bank Indonesia expected changing people transaction behavior into electronic payment coincide with government plan to diminish cash transaction.

Related with that, Electronic Toll Card as one of electronic money offer the solution of congestion caused by queuing at toll gate. It offers fast transaction without cash. Gate with cash transaction can take approximately 1 minute for one car. Meanwhile, using E-Toll card process to finishing the transaction can be finished only in a few seconds. Using RFID technology applied in electronic payment, E-Toll give easiness transaction experience to highway users. In other benefit, with using E-Toll card, highway user entry in special gate; Automatic Gate Toll (GTO), exclusively separate with cash transaction. With the benefit of GTO, highway user can save more time without queue during the transaction.

Since 2009 Electronic toll was launched, user growth deemed not significant with total E-toll user only 20%. In the fact, most of highway user decide to queue in conventional gate during waiting to finishing the transacton. Conventional gate still more superior in gate quantity if compared by automatic gate toll with smaller amount of gate. Other effect of queue in conventional gate causing the traffic jam on open gate lane and it happen in peak season such as in weekend and holiday season. In the crowded condition, several highway users may trapped in automatic gate toll with cause highway user assuming automatic gate toll is conventional gate supporting with condition the gate without obstacle and the user can finish the transaction with cash payment on automatic gate toll. Based on several radio reports, this case can happen many times.

Related with the issues, acceptance from the toll road user to use E-toll card has important role for successful implementation to make the E-Toll. Thus, this research is uses Technology Acceptance Model to explain the customer behavior in relation with E-Toll usage. Previous research has been conduct in online banking in Finland (Pikkarien, Karjaluto, & Pahnla, 2004), wireless internet in USA (Lu, Yu, Liu, & Yao, 2003), teleworking in Spain (Perez, Sanchez, Carnicer, & Jimenez, 2004), smart watch in South Seoul, Korea (Kim & Shin, 2014), and social network sector in Braga, Portugal (Pinho & Soares, 2011). Meanwhile other factors that influence user acceptance are trust and self-efficacy (Chong, Lin, & Chua, 20013). The purpose of this research to assessing customer acceptance towards intention to using E-Toll card with Technology Acceptance Model, and self-efficacy.

### **Research Objective**

The purpose this research is to:

1. To investigate perceived usefulness of a using E-Toll card
2. To investigate perceived ease of use of a using E-Toll card
3. To investigate attitude toward use of a using E-Toll card
4. To investigate trust of using E-Toll card
5. To investigate self-efficacy of using E-Toll card
6. To investigate the relationship between perceived usefulness, perceived ease of use, attitude toward use, trust, and self-efficacy to behavioral intention.

### **Research Questions**

The research is represented the question of the problem statement which consist:

1. What is the relationship between Perceived ease of use and intention to use E-Toll Card
2. What is the relationship between Perceived usefulness and intention to use E-Toll Card
3. What is the relationship between attitude toward and intention to use E-Toll Card
4. What is the relationship between self-efficacy and intention to use E-Toll Card

### **Research Limitation**

Since 2014, E-Toll card can be used for transaction other than toll payment. However, since many people aware of this the current study focus on E-Toll card as a tool for toll payment. The limitation of this research only conduct in Bandung and Jakarta city, route with most of high transaction volume.

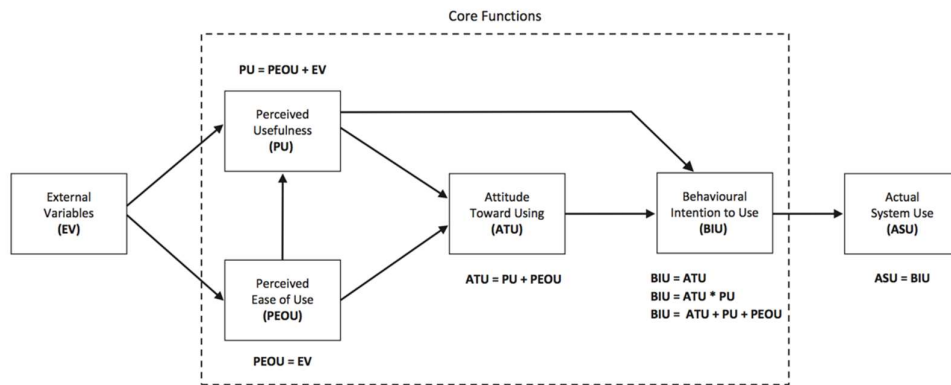
## Theoretical Foundation

### Consumer Buying Behavior

Consumer behavior is the study explaining the consumer as the individual or groups respond and behavior with purpose to identify decision process toward the product. Based on Solomon, 2015, in the consumer buying behavior there is 5 step in buyer decision process which consist of; problem recognition, information search, evaluation alternative, purchase decision and last is post purchase.

### Technology Acceptance Model

Technology Acceptance Model is a framework aim to explain the acceptance consumer system toward and explaining user behavior to use toward the technology. Technology Acceptance Model explain by six related different construct including external variables, perceived ease of use, perceived usefulness, attitude toward using, behavioral intention to use, and actual system use (Davis, Bagozzi & Warshaw, 1989).



Perceive usefulness and perceived ease of use as the key to determining an individual's information system acceptance with looking into determine attitude toward use and behavioral intention to use. Perceived usefulness role as dependent variable from perceived ease of use as direct influencer and independent variables to predict actual toward use and also behavioral intention to use. Attitude toward using was role as mediating variable, influenced from perceived ease of use and perceived ease of use. After that attitude toward use and perceived usefulness will affect behavioral intention to use.

### Perceived Usefulness

Refer from Davis (1989) perceived usefulness was defined as "the level of person believes that using a particular system would enhance his/her task performance". In this study, perceived usefulness as the factor that affect consumer to accept the E-toll card as the payment method based on the beliefs by using the E-toll card, the consumer will get fast and effective transactions.

### Perceive Ease of Use

Perceived Ease of use defined as "the degree to which a person believes that on using a particular system/product would be free effort", according Davis (1989). Concisely related with the study, perceived ease of use is the factor which belief the consumer or users would not confused by using the E-Toll card, and easy to understand and use it.

### Attitude Toward

Attitude toward to use is the mediating affective result from perceived usefulness and perceived ease of use, transforming into intention to use. Concisely, the consumer attitude toward using a given system is a precede to intention to adopt (Davis, 1998). The consumer are tend to have uncertainty formed beliefs and attitude concern on system to be developed (Hartwick and Barki, 1994) and the consumer are tend to have formed favorable and unfavorable attitude toward.

### Behavior Intention to Use

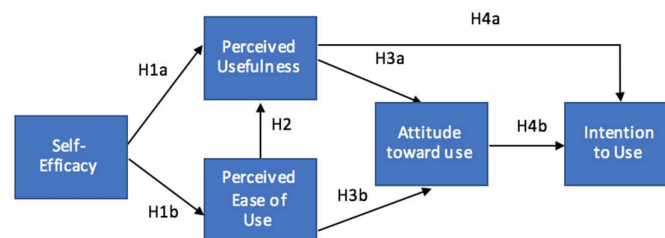
Refer Fishbein & Azjen (1975) behavioral intention is a user subjective probability that will affect the behavior. The purposed of behavioral intention to use variable is to predict actual purchase and usage behavior of user. The core aspect of intention to use is about user interest, intention to forthwith use the product/service, and look further information about the product/service (Lai, 2012; Miliani et al. 2013; Chauan, 2014)

### Self-Efficacy

Self-Efficacy is one of extensive research in perceived ease of use and a key concept social cognitive theory. Self-Efficacy define as "judgements on people capabilities on organizing and executing course of action required to accord with prospective situation" (Bandura,1982). Self-Efficacy affect into people's behavior to perform, measure of effort ready to use and measure of time will insist to solved obstacle.

### Hypothesis Development

The theoretical framework in this study is develop based on the concept and literature review from previous research. The researcher will eliminate several factors which have not significant relationship with the research



In addition, this is hypothesis based on the theoretical framework, consist of:

H1a: There is a significant relationship between self-efficacy and perceived ease of used E-Toll card.

H1b: There is a significant relationship between self-efficacy and perceived usefulness E-Toll card.

H2: There is significant relationship between perceived ease of use and perceived usefulness E-Toll card

H3a: There is significant relationship between perceived usefulness and attitude toward use E-Toll card

H3b: There is significant relationship between perceived ease of use and attitude toward use E-Toll card

## **Research Methodology**

In the beginning this research, researcher need to designed the flow of the research from the start until the research done and it considered with many aspects of this research. Those the process are problem identification, literature review, data collection, data analysis, and result and interpretation. The methodology was used in this research is quantitative method.

## **Population & Sample**

The targeted population of this research are Bandung and Jakarta citizen, men and women with legal age 18 years or over based on requirement to obtain driver license who travel with car. The population in Jakarta is 7.654.209 people, Bandung is 1.892.155 people. According to those data, the population for the research is 9.546.364 people. (BPS, 2015). However, the number of population, not all have driving licenses.

According the formula that above with number of population and error margin, the appropriate of sample size is 100 respondents. The researcher use 10% margin of error due to the time constraint. However, the total number of population is not exactly all of them have a driving license. Refer to Malhotra (2006) type of the study, related this study with the type of study problem solving the sample size will be 200 respondents. The sample size of this research will be 200 respondents.

## **Data gathering method**

This research, researcher will be gathered data from primary and secondary data. For gather primary data, the researcher was developed questionnaire and the secondary data gathered from journals, books, and web sources to support develop a questionnaire. The questionnaires were distributed through online channel, such as E-mail, personal chat message, and other social media.

## **Data Analysis Method**

This research was using two analysis including multi linear regression and path analysis. The purpose of the linear regression is as the method aim to indicate the extent linear relationship between independent variable and dependent variable. The objective using linear regression as methodology is to specify the value of the dependent variable based of values one or more independent variables. This study will utilize the multi linear regression with cause the data show more than one independent variables affect the dependent variable. Path analysis is an extension from the multilinear regression with the advantage encourage the development of logical thinking around process influencing an outcome. According to Hair & Black (2006) the purpose of path analysis is to analyze the comparative test of direct and indirect correlation and also in each variable and understanding the strength relationship between each variable.

## **Data Analysis**

In this research gender of the respondent was not limited. The result show that respondents consist of Male which account 53% of respondents and Female which account 47%. Most of the respondents come from the Male. Most of the respondents comes from people with aged 21-25 years old which account 54% (108 respondents) from total of the respondents. It comes from the survey distribution mostly spread over friends. The second, with 26% (51 respondents) the respondents come from people with aged over 35 years old. The dominant respondents come from Bandung which account 81% from total of respondents which is

this research distributed from Bandung itself. The frequency of respondent using toll road in one month shows 51% respondent using toll road between 1-2 times, 30% respondents use toll more than 4 times, and 19% respondents use toll road 3-4 times.

### Multi Linear Regression

For calculating multi linear regression, the researcher will divide into four part according the research question. First part is to investigate the relationship between Self-Efficacy, Perceived Ease of Use toward Perceived Usefulness. The second part to investigate relationship between Self-Efficacy toward Perceived Ease of Use. The third part is to investigate relationship between Perceived Usefulness and Perceived Ease of Use toward Attitude toward use. The last part is to investigate relationship between Perceived Usefulness and Attitude Toward Use toward Intention to Use.

Variable	R	R Square	Adjusted Square	Std. Error of the Estimate
(SE,PEOU)-PU	.693 <sup>a</sup>	.480	.474	.68161745
SE-PEOU	.308 <sup>a</sup>	.095	.090	.89610415
(PEOU,PU)-AT	.828 <sup>a</sup>	.686	.683	.53964444
(PU,AT)-IU	.755 <sup>a</sup>	.569	.565	.64758199

The result show the of the R square is 0.48, which mean 48 percent of the predictor including self-efficacy and perceived ease of use can explained perceived usefulness. Meanwhile the 52 percent can be explained from others factor exclude from this research. R Square score related relationship self-efficacy towards perceived ease of use. The result shows the R square is 0.095 which mean self-efficacy represent 9.5 percent of perceived ease of use, while the 91.5 percent can be represented from others variables exlude from this research. R square score for perceive ease of use and perceive usefulness toward attitude toward use. Based on the result of r square which account 0.686, both of the variable represented 68.6 percent of attitude toward, while the 31.4 percent is represented by others variables out from this research. r square score for perceived usefulness and attitude toward use towards intention to use. From the result, Perceived usefulness and attitude toward use have r square which account 0.569. It means both of variables represented 56.9 percent of intention to use, while 43.1 percent is represented by other variables exclude from this research.

- Relationship between Self-Efficacy, Perceived Ease of Use toward Perceived Usefulness.

There are significant relationship which account 0.00, between Self-Efficacy and Perceived Ease of Use towards Perceived Usefulness. Coefficient score for perceived ease of use towards perceived usefulness is 0.568 and coefficients score for self-efficacy is 0.258 towards perceive usefulness. The result is contrary to the previous research (Ozturk, 2016) the relationship between self-efficacy toward perceive usefulness is not significant. However in this research the result is supported according the result.

- Relationship between Self-Efficacy towards Perceived Ease of Use.

Self-Efficacy have significant relationship toward perceive ease of use with significant value in 0.00. the coefficients in relationship between Self-Efficacy and Perceive Ease of Use. The result shows the beta coefficients score self-efficacy towards perceive ease of use is 0.308.

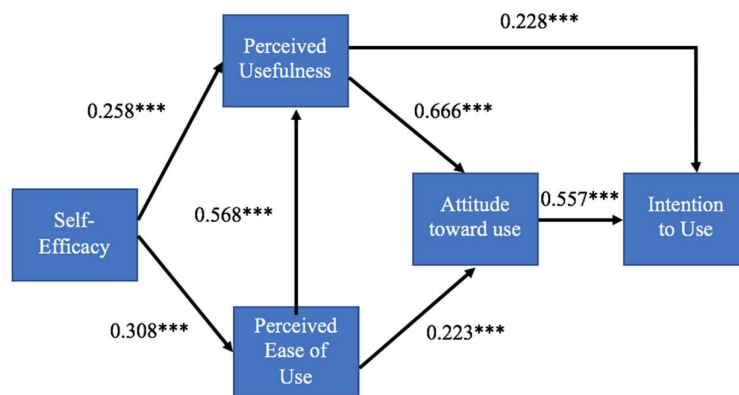
Based on the previous research (Ozturk, 2016) the result is supported, meanwhile in this research self-efficacy only represented 9.5 percent of perceive ease of use. According the previous research (Kim & Shin, 2014), perceive ease of use can represented by mobility and availability, however that variable is exclude on this research.

- Relationship between Perceived Ease of Use and Perceived Usefulness Towards Attitude Toward Use.

There is significant relationship between perceive usefulness and perceive ease of use towards attitude toward use with significant value 0.000. beta score perceived usefulness is 0.666 and perceive ease of use is 0.223 towards attitude toward use. The result is supported according the previous research Kim & Shin (2014) perceive usefulness and perceive ease of use are positive effects on attitude toward use.

- Relationship between Perceived Usefulness and Attitude Toward Use towards Intention to Use

Both of variables including perceive usefulness and attitude toward has significant relationship towards intention to use with significant value in 0.000. the coefficients score in relationship between perceive usefulness and attitude toward use towards intention to use. The result shows, beta score of attitude toward is 0.557 and perceive usefulness is 0.228 towards intention to use. The result is supported according the previous research (Soares, 2015) shows perceive attitude toward use leads to favorable intention to use and perceive usefulness has significant relationship toward intention to use.



### Path Analysis

Path analysis is to know indirect and total influence based on each variable toward intention to use. The analysis was correlated from multi regression result using beta score from the result from coefficients table.

Intervening	Independent	Dependent	P1	P2	P3	P4	TOTAL INDIRECT	DIRECT	TOTAL INFLUENCE
PU	SE	IU	0,258	0,228			0,059	0	0,297
PU, AT			0,258	0,666	0,557		0,095		
PEOU, AT			0,308	0,223	0,557		0,038		
PEOU, PU,			0,308	0,568	0,666	0,557	0,065		

AT									
PEOU, PU, IU			0,308	0,568	0,228		0,04		
AT	PU	IU	0,666	0,557			0,37	0,228	0,598
PU	PEOU	IU	0,568	0,228			0,13	0	0,465
PU, AT			0,568	0,666	0,557		0,211		
AT			0,223	0,557			0,124		
-	AT	IU					0	0.557	0.557

The result shows the perceive usefulness has strongest variable to affect intention to use with total influence score 0,598, the second strongest attitude toward use with beta score 0.557 and perceive ease of use with beta score 0.465. However, Self-efficacy have a weak affect the intention to use with beta score 0.297.

### Conclusion and recommendation

#### Conclusion

According the result from the data analysis can be conclude each of the variable including self-efficacy, perceive usefulness, perceive ease of use, and attitude toward are significantly relationship with each variable based on the hypothesis development with the value of significant 0.000. Based on the r square score, each of variable have a percentage to represented the variable. Compared r square score with each relationship of variable, perceive ease of use and perceive usefulness have the highest r square score to represented attitude toward use which account 68.6 percent. Meanwhile self-efficacy only 9.5 percent to represented perceive ease of use, and 91.5 percent is represented by other variables exclude this research. Following the result, in this below are conclusion of hypothesis to answer the research question.

H1a: There is significant relationship self-efficacy and perceived ease of use

Based on the result of the research shows that the relationship between self-efficacy affect perceive ease of use with value of beta 0.308 and significant value 0.000. The result shows the hypothesis is supported

H1b: There is a significant relationship between self-efficacy and perceived usefulness E-Toll card.

Based on the result of the research shows that the relationship between self-efficacy and perceive ease of use affect perceive usefulness with value of beta 0.258 and significant value 0.000. The result shows the hypothesis is supported

H2: There is significant relationship between perceived ease of use toward perceived usefulness E-Toll card

Based on the result of the research shows that the relationship between perceived ease of use toward perceived usefulness with value of beta 0.568 and significant value 0.000. The result shows the hypothesis is supported

H3a: There is significant relationship between perceived usefulness and attitude toward use E-Toll card



Based on the result of the research shows that the relationship between perceive usefulness toward attitude toward use with value of beta 0.666 and significant value 0.000. The result shows the hypothesis is supported

H3b: There is significant relationship between perceived ease of use and attitude toward use E-Toll card

Based on the result of the research shows that the relationship between perceive ease of use toward attitude toward use with value of beta 0.223 and significant value 0.000. The result shows the hypothesis is supported

H4a: There is significant relationship between perceived usefulness and intention to use E-Toll card

Based on the result of the research shows that the relationship between perceive usefulness toward intention to use with value of beta 0.228 and significant value 0.000. The result shows the hypothesis is supported

H4b: There is significant relationship between attitude toward use and behavioral intention to use E-Toll card

Based on the result of the research shows that the relationship between attitude toward use toward intention to use with value of beta 0.557 and significant value 0.000. The result shows the hypothesis is supported

According the path analysis shows perceive usefulness is strongest variable to affect intention to use with total influence 0.598. Attitude toward use have a total influence toward intention to use which account 0.557, perceive ease of use have a total influence toward intention to use which account 0.465, and self-efficacy have total influence 0.297 toward intention to use. The total influence score based on the total indirect and direct of the variables.

### **Recommendation**

The company should improve marketing strategies to keep the user growth. There are several recommendations for the company, as follows:

- Improve the customer awareness about E-Toll card payment from how and where to buy it and how to refillable the balance of E-Toll
- Connected to mobile apps to make the customer easier to know the balance and refillable the balance.
- Keep the commitment to the customer about E-Toll payment as the simply and faster payment to increase perceive ease of use customer

### **Future Research**

As for the further research recommendation, there are several things that recommend including:

- Most of the respondent of this research coming from Bandung, for further analysis can be held in other big cities
- For the further research can investigate the other variables can represented the perceive ease of use beside self-efficacy.

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