Technology Acceptance Model of Mobile Ticketing

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Abstract—**Technology Acceptance Model (TMA), which was first coined by Davis (1989) is one of the studies in Information Systems Technology (STI) are most studied. Research in this area seeks to identify the factors that cause people are willing to accept and use information systems. But there is not much to explain about the m-commerce, especially mobile ticketing service. So many variables have been investigating the antecedents of intention to use. Antecedent variables that investigate in this research are *prior experience, perceived ease of use, perceived usefulness, trust, perceived risk. Those* variables thought to affect intention to use. Study sample is M-Tix 21 users in Kotamadya Yogyakarta who were selected purposively. The number of samples analyzed 111 of the 120 questionnaires distributed questionnaires obtained during the data collection period June-July 2011. The result showed that *prior experience, perceived usefulness, trust,* have positive influence on intention to use.*Perceived risk* has negative effect on intention to use. Meanwhile perceived ease of use have positive influence but not significant on intention to use.**

Keywords: prior experience, perceived ease of use, perceived usefulness, trust, perceived risk, intention to use, mobile ticketing service

I. INTRODUCTION

Technology Acceptance Model (TMA) which was first coined by Davis [4] is one of the studies in Information Systems Technology (STI) are most widely studied. Research in this field trying to identify the factors that cause people are willing to accept and use information systems. This interest has increased as more information and context of the broader system. Information technology system not only involves technology that is implemented in the organization but also to enhance good relations with outsiders such as suppliers and customers using the internet and mobile phone network.

One form of TAM is the development of contextual factors [10]. Contextual factors related to characteristics of technology, gender and culture. In the context of the technological characteristics of certain attitudes, intentions and behavior of technology adoption is not solely influenced by the perceived usefulness and perceived ease of use. But there are special factors related to characteristics of the technology used.

Although many studies have been conducted to examine the adoption of technology, but there is not much to explain about the m-commerce, especially mobile ticketing service. M-commerce (mobile commerce) refers to any transaction that

directly or indirectly by using a certain monetary value that is implemented in a wireless telecommunications network. Mobile ticketing service is one of m-commerce form.

Ticketing services through SMS or internet is a form of technology that makes consumer easier to purchase. Through this service customers can buy tickets without the queues and provide a special time. Tickets are usually sold at public transport such as in Finland [12] and Iran [2]. In Indonesia, a company that provides this service is 21 Cineplex Cinema named M-tix 21.

Study of Wu and Wang [18], stating that the application of m-commerce users can be predicted quite well with the intention of use is significantly influenced by the perceived risk, cost, compatibility and perceived usefulness. Perceived ease of use affect the intention of use but must go through the perceived of usefulness.

Study Mallat and et al., [12] and Babaee [2] explained that most strongly vary impact on technology to use previous experience. Variables are believed to have a significant influence on the intended use of the technology is perceived ease of use (usability), perceived usefulness (perceived benefits), previous experience (experience), perceived trust (the trust) and perceived risk (risk). Those variables are use as the determinant of the intention to use mobile ticketing service in this research.

A form of mobile services available on the Indonesia ticket is the purchase of tickets for services 21 Cineplex called M-Tix 21 rooms. This service allows consumers to make purchases in 21 entries cinema Cineplex via SMS and the Internet tariffs without any premium or discount charges (free). This service can be enjoyed after a consumer to register or enroll in M-Tix booth located in the theaters that offer services of M-Tix 21. To register the consumer obtains the first E-Wallet IDR 150,000, - it is valid for 1 (one) year. Each time that you make a purchase, E-Wallet balance will be reduced. When was being the confirmation, the consumers show live at the grossing at the entrance to the cinema. This research will be the purchase of movie tickets through M-Tix 21 as research object.

Based on theoretical and contextual background that the research question posed is how the influence of previous experience, perceived usefulness, perceived ease of use of trust and perceived risk perceived intention to use the services of mobile ticketing technology M- Tix 21?

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II. LITERATURE REVIEW

A. *Intention to Use Theater Mobile Ticketing*

Intention to use is the desire (intention) a person to perform certain behaviors. Intentions are not always static, can change over time [9]. Intentions can predict behavior accurately enough, that by itself the purpose of providing information about the reasons for doing certain behaviors. The purpose of the use is part of the theory of Reasoned Action (TRA) explains that a person's intention to perform (or not do) is that attitude is a direct determinant of the action or behavior.

In e-commerce, the intention is also called the use of intention to transact. Intention of use is define as consumers' desire to engage in exchange relationships with providers of goods and services on the web such as sharing business information, maintaining business relationships and conduct business transactions [12]. Understanding intention in the use of e-commerce can also be applied in m-commerce.

B. *Prior experience*

Previous studies showed that previous experience determines the behavior [5]. It was found that there are significant differences between experienced users and users who are experienced in the use of technology. For experienced users, there is a strong influence between intention and usage [5]. Agarwal and Prasad [1] reported a strong relationship between prior experiences with technology adoption. Individuals become more experienced with information technology, have high intention which then encourages the use of technology in actual [5]. According to a study by [11] in addition to relative advantage and complexity, the ability to test the service prior to adoption and observing the success is key in customer adoption of mobile commerce services [11]. Based on several previous studies can be constructed a hypothesis

Hypothesis 1: prior experience has positive effect on intention to use

C. *Perceived ease of use*

Ease of use is defined as a person who believes that the level of perception using technology that will be free from effort [4]. This building is the belief about decision-making process. If someone feels inform so he/she have believe that this system is easy to use so he will use it. Conversely, if a person feels confident that the information system is not easy to use so he will not use it [8].

In the TAM model, ease of use and usefulness perception are associated with attitudes, intentions and actual use of technology. When compared with the perceived benefits, ease of use perception is more stable construction. Sometimes this construction has a positive effect on attitude, but sometimes not [19]. In research Mallat et al.[12], this construction has a small but significant contribution to influence intention to use ticket purchasing services through mobile phones.

According Dahlherg et al.[3], based on the results of group interviews are often claimed ease of use of informants.

Consumers consider the ease of the procedure of payment through mobile phones is very important for their acceptance [19].

Hypothesis 2: perceived ease of use has positive effect on intention to use

D. *Perceived usefulness*

Perceived usefulness as the degree one believes that the use of a particular system would enhance their performance [4]. According to Mallat et al.[12]. The perceived benefits are the main predictors of intention of use.

The perceived benefits have been widely confirmed as an important construct and received much attention from previous research. From 72 studies about TAM, 71 of them showed that this construct significantly affect attitudes and intentions of use [17]. In a study of payment services via a mobile phone (m-payment), the respondents considered the main benefit of this system is the speed of making payments. The benefit is that consumers have the intention to encourage the use of the system [14]. Speed service is improving the effectiveness and efficiency of everyday consumer life.

Hypothesis 3: perceived usefulness has positive effect on intention to use

E. *Trust*

Trust is an important construct that determines the intention to adopt technology and mobile services [7], [13], [12]. This is important concept because there is spatial distance between the buyer and seller. More over the buyer must provide personal information such as phone numbers or credit card number to the seller. Buyers must ensure that the information is not misused by the seller. Spatial distance makes the buyer must ensure that funds provided will be replaced by the promised services or goods seller within the agreed time.

Trust to others is a set of beliefs about the perception of the conduct of individuals. This belief was formed on the basis of (1) the capacity, the virtue (2) and integrity (3). Capacity is interpreted as confidence in other party ability to meet the needs of the consumer. Virtue is the goodwill of the other parties to the transaction is not only for their personal benefit, but more than that it complies with the agreement. Integrity is designed as a confidence of consumers than the other parts to maintain the offer, revealed truth, and fulfill his promise to act with ethics [16]. The transaction, in particular online transaction, is an act which contains high uncertainty. One way to reduce uncertainty is trust between both parties. Confidence is needed in the service of selling tickets via cell phone, because the physical evidence that consumer in the form of ticket is usually obtained only replaced with a text message. If consumers have confidence in service providers so that consumers will have a positive attitude toward technology. So finally he has the intention to try and realize his intentions.

Hypothesis 4: trust has positive effect on intention to use

F.   Perceived Risk

Definition of risk has changed since online transactions (electronic commerce) are popular. In the past, risk was mainly because of fraud and product quality. Then at the moment, the risk of problems associated with technological, psychological, and time [16].

Perceived risk has negative impact to adoption of trade through mobile phones [18]. These risks arise primarily because of the limitations of mobile networks, devices and solutions of actual payment [12].

In some places, the mobile network has a limited connection and speed [15] and network coverage [12]. Limitations are also caused by physical conditions such as consumers who owned a small cell phone screen, keypad, power limitations, the ability to store data, and battery power [12]. These things affect the level of risk in using mobile phone applications.

So far, online transactions, including the use of mobile phones is still far from perfect. Affective and cognitive factors play an important role in shaping the perception of risk. Some users still consider the technology used is no substitute for physical transactions. Because the intention to use the Internet for transactions involving some degree of uncertainty perceived risk was included as a direct antecedent to the use of technology.

Hypothesis 5: perceived risk has negative effect on intention to use

III. Research Methods

A.   Sample and Data Collecting Technique

This study population is consumer of 21 Cineplex network. Because the sample frame is not available, then studies using non-probability sampling. Selection of the sample is using purposive sampling. Requirements to be sampled in this study were M-Tix users who never use more than one year.

The questionnaire contains questions about perceived usefulness perceived ease of use, intention to use his study came from [18]. Questions about previous experience are developing from Babaee Nasser's questionnaire [2]. Questions about trust and perceived risk of the questions about trust and perceived risk of the questionnaire that was developed by Mallat, et al [12]. All variables in this study were measured using a Likert scale with a scale of 1 to 5. Each alternative answer will be given numerical values as follows: strongly disagree = 1, disagree = 2, neutral = 3, agree = 4, and strongly agree = 5.

The type of data that is needed is the primary data in the form of respondents, the questionnaire provided. The questionnaire consists of two parts: The first part is the questions about demographic characteristics such as name, gender, age, average frequency of use of M-Tix 21 in month, education, mobile operators are used, the mode of cell phone use and how to use online transactions. The second part is a question or a statement relating to the research variables:

previous experience (2 questions), perceived ease of use (5 questions), perceived benefits (six questions), belief (8 questions) and perceived risk (13 questions).

Data collecting was held for two months June-July 2011. During the period, a total of 120 questionnaires can be obtained. Of these, complete and can be further analyzed a number of 110 questionnaires.

B.   Analysis Method

The data obtained was tested by the method of regression. Before test of hypothesis, we conduct validity and reliability test. Validity test was using confirmatory factor analysis (CFA) to see the value of the load factor above 0.4. Reliability test carried out by looking at the value of Cronbach's alpha is greater than 0.05 [7]. The data analysis is using SPSS for Windows 18 software.

Multiple regression is used to determine the effect of independent variables (denoted X) and dependent variable (denoted Y). Dependent variable, namely the intention of use (Y1) and previous experience of independent variables (X1), perceived ease of use (X2), perceived usefulness (X3), trust (X4) and perceived risk (X5). The equation to be tested in this study is as follows.

$$Y1 = a + X1 + X2 + X3 + X4 + X5$$

Information:
Y1   : Intention of use
X1   : Prior experience
X2   : Perceived ease of use
X3   : Perceived usefulness
X4   : Trust
X5   : Perceived risk
a   : regression coefficient (slope) : residual

Criteria for hypothesis testing as follows.

a)   The probability of significance> 0.05 then Ho is accepted, which means that the independent variable has no effect on the dependent variable.

b)   The probability of significance <0.05 then Ho is rejected, which means that the independent variables significantly affect the dependent variable.

IV. Result

A.   Respondent Characteristic

Characteristics of respondents who reviewed include sex, age, use m-Tix per month, education, maintenance, use of cellular phone and use of online transactions. The respondents on the basis of sex, 55.72% or 58 people are women and 47.27% or 52 from male. Based on age, there are 58% or 64 respondents aged 15-24 years old, or 43% of respondents aged 39 25-34 years, and 2.7% or 3 people aged 35-44 years. Level of education includes high school (7 persons), diploma (17 persons), S1 (81 people), S2-S3 (5 people).

In the case of M-Tix average of 59 respondents used 1-2 times. There are 38 respondents answered 3-4 times, 9 people use more than 5 times, and 6 respondents did not answer. Based

on the operator used; XL (24 respondents), Indosat (24 respondents), Sympathy (26 respondents), Esia (1 respondent), other (5 respondents).

Respondent habit of using a mobile phone is surprise. Most respondents (91.8% or 101) stated, always use the cell phone only 9 people use during the validity of all respondents are users of cellular phones in terms of online transactions, 11 respondents who are not used, the 24 respondents fiscally, 44 people were accustomed to meet while the remaining 31 respondents very familiar.

B.   Data Analysis and Hyphothesis Testing

Before performing data analysis tested the validity and reliability of the instrument. Testing the validity of using the confirmation analysis. By using a loading factor of the general rules of> 0.4 [7] If the indicator has a loading factor of less than 0.4 is considered invalid. All indicators on the intention of use, previous experience, perceived ease of use, perceived benefits, trust, perceived risk applies. Reliability testing is using Cronbach alpha. Its value as follows: the intention of use (0.848), previous experience (0.787), perceived ease of use (0.771), perceived usefulness (0.780), confidence (0.878), perceived risk (0.786).

Based on the results of the above processing, it is known that the variable of previous experience has a positive and significant influence on intention to use, as indicated by the significance of the research results of 0, 043 where the value is smaller than the value of t is defined in the same study with 0, 05. Constant (α) of 1.715, 0.128 coefficient of previous experience.

Perceived ease of use variable, the results showed a positive but not significant effect that the value of t is greater that the value of t is defined in this study which is equal to 0.502, perceived ease of use of 0.013 coefficient.

Perceived risk variable is positive and significant impact on the intended use. Magnitude of the alleged risk of variable coefficient of significance level 0.521 and 0.000. Although variable trust from the test results are positive and significant impact on the intended use, by a factor of 0.94, and the value of level 0, 018.

Fifthly, the dependent variable is perceived usefulness also has its positive and significant impact on the intended use. Impact value 0.293 with significance level 0.000.

Magnitude of the effect of variables on previous experience, perceived ease of use, perceived usefulness, trust and risk perception on intention to use is indicated by the R squared value of 0, 935 or 93.5%, this means that the experience of 93.5% before the variable, perceived ease of use, risk variables perceived usefulness, perceived confidence and could explain the intention to use, and the remaining 6.5% influenced by other variables that are not used in this study. Independent variables that have a strong influence on the intention to use the perceived usefulness, shown from the standard coefficient values and the value t count is higher than most other independent variables.

Based on Table 1, the unstandardized coefficient regression equation can be arranged as follows:

Y = 1,715 + 0,128(X1) + 0,013(X2) + 0,521(X3) + 0,094(X4) - 0,293 (X5)

Table 1. Results of regression analysis of independent variables on the dependent variable

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.715	.281		6.102	.000
PRI_EXP	.128	.062	.119	2.060	.042
PER_EASE	.013	.019	.027	.674	.502
PER_USE	.521	.054	.530	9.695	.000
TRUST	.094	.039	.089	2.409	.018
PER_RISK	-.293	.058	.276	5.072	.000

Based on regression equations above, can explain that the higher previous experience, perceived ease of use, perceived usefulness, trust and the lower perceived risk, the higher the intention to use. Especially for perceived ease of use variable, despite its influence of the intention to use, but not significant. Hypothesis test is described as follows.

Based on data analyze, the probability of a significance of 0.042, smaller than (0.05) H1, **prior experience has positive effect on intention to use,** is therefore supported. This means that previous experiences have a positive and significant impact on intention to us.   Significance probability value of 0.502, greater than (0.05) is therefore not supported H2which is **perceived ease of use has positive effect on intention to use**. This means that the perceived ease of use but no significant positive effect on intention to use.

Significance probability value is 0,000, less than 0,05, therefore H3, **perceived usefulness has positive effect on intention to use,** is supported. This means that the perceived usefulness have a positive and significant impact on intention to use.

Significance probability value of 0.018, smaller than (0.05) is therefore supported H4: **trust has positive effect on intention to use**. This means that trust has a positive and significant impact on intention to use.

Value of significance probability of 0,000, less than (0.05) therefore, H5**, perceived risk has negative effect on intention to use,** is compatible. This means that the perception of risk and a significant negative effect on the intention of use.

C.   Discussion

This study is a replication of the technology acceptance model with various types of technology. Previous studies called mobile commerce is its [18], and mobile ticketing in public transportation [12]; [2]. Construction is selected in this study is

considered the most important building affect the use of mobile ticketing.

The first States the hypothesis that there is influence of variable prior experience on the intention to use the service experienced by M-Tix user. The results showed that positive experience variables and significant impact on the intended use of the consumer. This means that the first hypothesis, proposed at the same time supports the results supported previous studies conducted by Mallat et al. [12]; [2]. This is because previous experience is linked to a large extent with the intent to use. If users have any prior experience or are accustomed to using mobile phones and Web sites for the operation, he wishes to buy a ticket using m-Tix service will increase, since, in accordance with their own habits. This is reflected in their answers to questions about the habit of using mobile phones (91.8%) and online transactions (40%) are high.

The second hypothesis in research shows that there are variables affecting perceived ease of use to intention to use it positively. The results showed that the perceived ease of use to create a favorable atmosphere, but not significant. This study is similar conclusions [6]. Perceived ease of use (PEOU) would not affect IT adoption because IT ease-of-use is not an inherent quality of the purchased product. On the other hand, when the Web site is used to inquire about products, PEOU should affect IT adoption because the required information is embedded in the IT and thus its quality is directly related to IT ease-of-use [6].

The third hypothesis proposed in this study is that perceived usefulness has a positive impact on the intended use. From the results of research it is known that perceived usefulness variables provide the greatest positive impact on the intention to use compared to other variables. These results highlight the previous study, which stated that the perceived usefulness of increasing consumer intention to conduct transactions via mobile phone [18].

The fourth hypothesis in this study was to estimate the trust will have a positive effect on intention to use. The results showed that the hypothesis is supported. This means that the four proposed hypotheses are supported and supports the results of previous research conducted by Mallat [12] and Nasser Babaee [2]. The importance of trust is highlighted in electronic and mobile commerce because of the spatial and temporal separation between buyer and seller and because buyers are required to give delicate personal information such as telephone number or credit card number to the seller.

The fifth hypothesis is that perceived risk negatively influences intention to use. Based on known studies confirm this hypothesis. Perceived risk refers to certain types of financial, product performance, social, psychological, physical, or time risks when consumers make transactions online. This study reinforces previous research conducted by Mallat et al.[11], [18].

V. RECOMMENDATION FOR FURTHER RESEARCH

The results of this study and the limitations that are found in the study can be used as a source of ideas for the development of future research, for research development suggested from this study is to add independent variables that influence intention to use or to further examine the effect of intention to use the actual usage. Future studies should also use the data if other methods such as Structural Equation Modeling in order to test a more complicated model that captured the phenomenon better.

REFERENCES

[1] Agarwal. Ritu, and Prasad, Jayed, "Are individual differences Germane to the acceptance of new information technologies?," Decision Science, vol. 30(2), pp. 361-391. , Spring 1999.

[2] Babaee. Nasser., "Investigating Effective Factors and Presenting a Pratical Guideline to Adoption of Mobile Ticketing," unpublished thesis. 2010.

[3] Dahlberg. Tomi, and Oorni. Ansii, "Understanding Changes in Consumer Payment Habits- Do Mobile Payment Electronic Invoices Attract Consumer?," Proc. Of the 40ᵗʰ Hawaii International Conference on System Science, 2007.

[4] Davis. Fred, D., "Perceived usefulness, perceived ease of use and user acceptance of information technology," MIS Quarterly, vol 3(3), pp: 391-340., September 1989.

[5] Gardner. Christina, and Amoroso. Donald. L., "Development of an instrument to measure the acceptance of internet technology by consumer," Proc. Of the 37ᵗʰ Hawaii International Conference on System Science, 2004.

[6] Gefen. David, and Straub. Detmar, W., "The relative importance of perceived ease of use in IS adoption: a study of E-commerce adoption," Journal of the Association for Information System, Vol 1, pp: 1-30, October 2000.

[7] Hair. Joseph. F, Black. Bill, Babin. Barry, Anderson. Rolph E, and Tatham. Ronald. Multivariate Data Analysis7ᵗʰ ed. Prentice Hall, 2010.

[8] Jarvenpaa. SL, and Lang. KR, "Managing the paradoxes of mobile technology," Inf Syst Manage 22:7–23, 2005.

[9] Jogiyanto, 2010, Sistem Informasi Berbasis Keprilakuan, Penerbit BPFE Yogyakarta

[10] King. William. R, and He. Ju, "A meta-analysis of the technology acceptance model", Information and Management, May. 2005.

[11] Lee. I, Kim. J, Kim. J, "Use contexts for the mobile internet: a longitudinal study monitoring actual use of mobile internet services," Int J Hum–Comput Interact, vol. 18, 2005, pp. 269–292.

[12] Mallat, Niina., Rossi, Matti., Tuunainen, Kristiina, Virpi., Oorni, Anssi., "An empirical investigation of mobile ticketing service in public transportation," Pers Ubiquit Comput, vol. 12, 2010, pp: 57-65.

[13] Pavlou. PA, "Consumer acceptance of electronic com- merce: integrating trust and risk with the technology acceptance model," Int J Electron Commer, vol. 7, 2003, pp:101–134.

[14] Pousttchi. Key, "Conditions for acceptance and usage of payment procedure," Proc. The Second International Conference on Mobile Business. Vienna, 2003. pp. 201-210.

[15] Siau. K, Shen. Z, "Building customer trust in mobile commerce," Commun ACM, vol. 46, 2003, pp:91–94.

[16] Suh. Bomil, and Han. Ingoo, "Effect of trust on customer acceptance of internet banking," Electronic Commerce Research and Application, vol. 1, 2002, pp: 247-263.

[17] Sun. Heshan, and Zhang. Ping, "The role of moderating factors in user technology acceptance," J Human-Computer Studies, vol. 64, 2006, pp:53-78.

[18] Wu. J-H, Wang. S-C, "What drives mobile commerce? An empirical evaluation of the revised technology acceptance model," Inf Manage vol. 42, 2005, pp: 719–729.

[19] Zmijewska. Agnieszka., Lawrence. Elaine, and Steele. Robert, "Toward understanding of factors influencing user acceptance of mobile payment," Proc. IADIS International Conference WWW, 2004, pp: 270-277.