

Critical Factor of Mobile Payment Acceptance in Millennial Generation:

Study on the UTAUT model

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Abstract—The millennial generation is considered a golden generation in the world and Indonesia, in particular, that is capable of being the driving force of changes. They want everything to be fast and easy, especially transactions. Mobile payments provide a fast and easy solution for making payments wherever and whenever. The main objective of this research is to study the factors that influence the acceptance of mobile payment use in the millennial generation using the unified theory of acceptance and use of technology model. Questionnaires were distributed through Google Form. The participant in this study amounted to 125, which were chosen through purposive sampling method. Structural equation modelling - partial least square regression and SmartPLS 3.0 was employed as the measuring tools. Results of this study show a significant positive effect of performance expectancy, effort expectancy, and social influence on behavioural intention. Moreover, facilitating condition and behavioural intention on use behaviour millennial generation tend to use mobile payments as their payment instrument.

Keywords—*millennial generation; mobile payments; technology acceptance; UTAUT*

I. INTRODUCTION

Mobile payments are a new advancement in payment services. In 2012, Agusta and Hutabarat said that smartphone users in Indonesia have begun to switch to mobile payment transactions, which are far different from the use of bank accounts [1]. However, this finding is different from that of Lu et al. who found that approximately 73% of mobile payment users in China are concerned about security risks and mobile payment usage transactions [2].

Initially, the research results of Lu et al. are applicable in Indonesia, as evident from the big data analysis they are conducted in early 2012 [1,2]. The concern on-mobile payments has been overcome by increasing public confidence in the use of electronic money. On May 4, 2018, the Governor of Bank Indonesia officially issued a new regulation on the use of electronic money in Indonesia due to the increasing supply of non-cash transaction media GO-PAY and TCASH are the mobile payment applications with the largest number of users in Indonesia, reaching up to 10 million in 2017 [1,3].

The fundamental factor in the increase of mobile payment public consumption is the world's entry to the fourth industrial revolution. Setlur et al. describes this industrial revolution as an interconnection of highly intelligent cyber-physical systems or commonly referred to as the Internet of things [4]. Everything is connected to the Internet, such as ordering transportation equipment, food, clothing, and electricity payments. The ease of access in almost all of these industrial sectors has caused the current business pattern to become more dynamic in developing and developed countries [1,4].

The unified theory of acceptance and use of technology (UTAUT) can represent this condition. This model was initiated by Venkatesh et al. to measure the extent of technology acceptance from consumers' point of view [5]. This model measures the level of consumer expectations, business expectations and social influences and how conditions facilitate the use of mobile payment.

This model was chosen to highlight that the use of mobile payments in Indonesia does not only have a positive trend [1]. The existence of mobile payment has become an attraction in the fourth industrial revolution by going beyond the use of other media and growing new business patterns in almost all walks of life. In addition, the Ministry of Industry Indonesian was inaugurated at the beginning of the second quarter of 2018 [6]. Making Indonesia 4.0 also signifies that Indonesia is ready to face the changes of this revolution. Nonetheless, mobile payments in Indonesia have not been widely reviewed. Will the increase in the payment revolution affect the intensity of consumer behaviour towards mobile payment usage? How can this affect the level of user acceptance of mobile payment services? These questions underlie the need to study the adoption of mobile payment services.

A. UTAUT

Individual acceptance of information technology is one of the topic researched in the field of information systems [7]. UTAUT was first developed by Venkatesh et al. by adopting various models and studies. Some of the model they adopted are the theory of reasoned action by Fishbein and Ajzen, theory of planned behaviour by Ajzen [8], technology acceptance model by Davis [9], innovation diffusion theory [10]; model of

PC utilization by Thompson et al. [11]; motivational model of computers in workplace by Davis et al. [12], decomposed TPB by Taylor and Todd [13] and the social cognitive theory of computer utilization by Compeau and Higgins [14]. UTAUT aims to measure the acceptance and use of information technology in an organizational context [15]. It is based on four factors (performance expectancy, effort expectancy, social influence and facilitating conditions) and four moderator variables (age, gender, experience and voluntariness). Cheng, Liu and Qian suggested that performance expectancy and social influence in UTAUT are important variables in predicting user behaviour of a technology [16].

B. Performance Expectancy

Performance expectancy is defined as an individual's belief on certain innovations that will lead to positive results [17]. Venkatesh et al. argue that performance expectancy measures the extent to which the use of technology will provide benefits to users in carrying out certain activities [15]. Performance expectancy is adopted from several constructs, such as perceived usefulness, extrinsic motivation, job-fit, relative advantages and outcome expectations [5]. The comfortability of users feel comfortable when using technology, it will increase the expectations of the performance of the technology [18]. This argument is supported by previous research in which expectancy performance has been shown to influence behavioural intention [5,17,19–21]. Accordingly, the following hypothesis is proposed:

H1: Performance expectancy affects behavioural intention.

C. Effort Expectancy

Effort expectancy is the level of individual's understanding on the ease of users in using a technology [21]. When users feel that the use of technology is easy, the level of expectation for its good performance increases [18,22]. The use of mobile payment is easier and effectively eases payment processes compared with traditional payment methods; thus, users tend to intend to use mobile payments [19]. In the UTAUT and UTAUT 2 models, effort expectancy and effort expectancy have an influence on behavioural intention [5,17,19,21]. Accordingly, the following hypothesis is:

H2: Effort expectancy affects behavioural intention.

D. Social Influence

Social influence is defined as the extent to which users feel significant people around them believe that they must use a certain technology [21]. It is a person's perception of a technology that is affected by the views of his/her closest people, such as friends, family, classmates and social groups. Social influence is defined as an individual's perception of the views of others when performing certain actions [23]. Users will have a good image on the use of a technology when they gets social status in a group of users [24,25]. In previous studies [5,17,21,23] social influence was proven to have an influence on behavioural intention. In the context of mobile payments, social influence has a significant impact on behavioural intention [19,26]. Accordingly, the following hypothesis is presented:

H3: Social influence affects behavioural intention.

E. Facilitating Conditions

Facilitating conditions refers to one's trust in technical infrastructure that can support the use of technology [5,21,27]. When the infrastructure is ready to be used, facilitating condition comes as a guide, assistance and training that serves as means to support information systems [28]. Some researchers also support that facilitating conditions in the context of the use of technologies, such as mobile payments, mobile banking and mobile applications, have an influence on behavioural intention [5,21,23,28–30]. Accordingly, the following hypothesis is presented:

H4: Facilitating conditions affects behavioural intention

F. Behavioural Intention

Behavioural intention is an individual's readiness to perform certain behaviours and is assumed to be a behaviour carried out spontaneously [31]. Behavioural intention is a tendency to keep using a technology [9]. Based on previous research, behavioural intention affects the use of mobile payment [5,21,29,32]. Accordingly, the following hypothesis is presented:

H5: Behavioural intention affects the use of mobile payment.

II. RESEARCH METHODS

A. Measurement Instrument

Performance expectancy, effort expectancy, social influence, facilitating condition and behavioural intention variables, and use of technology were measured by adopting method from various researchers [5,33]. To measure performance expectancy, the authors adopted the UTAUT, where four questions were used to evaluate the use of mobile payments [5,33]. For effort expectancy, social influence and facilitating condition variables, four questions were also adopted. Then the behavioural intention variable uses a measurement consisting of three question items, and use of technology variable uses measurements based on the frequency of use. Each question item consists of 10 points that correspond to 'disagree' to 'strongly agree'.

B. Data Collection

Research data were obtained through online surveys using Google Docs as the media. This questionnaire was randomly distributed in each region on the island of Java, namely, West Java, Central Java and East Java. The sample in this study included 400 people with experiences of using mobile payment applications (such as GOPAY, TCASH, OVO, XL Cash, Pay Pro, Mandiri E-Cash and Sakuku). This study also used the partial least squares (PLS) regression as a measuring tool to determine the influence of each hypothesis.

III. RESULTS AND DISCUSSION

A. Data Analysis

Based on the data obtained, 73.76% female and 26.24% male filled out the questionnaire. The majority of the respondents aged 20–25 (67.38%) and 26–30 (18.44%). This number is in accordance with the criteria of the millennial generation who 18–37 years old. The percentage of participant aged above 35 years is equal to 0.71%. Most millennial (39.55%) uses GOPAY as their payment media. GOPAY is primarily used in the online transportation industry and has a variety of features, such as online shipping, document delivery, purchase of goods/services and daily payments (e.g. electricity, credit and Badan Penyelenggara Jaminan Sosial-BPJS). The average nationality morality chooses GOPAY as an effective and efficient payment tool. Mobile payment tools are also readily available in other applications (such as mobile banking and other mobile payment services). The proportion of usage for OVO payment instruments is 20.34%. The respondent profile is presented in the following table:

TABLE I. PROFILE RESPONDENT

Item	Variable	Percentage
Gender	Female	73.76%
	Male	26.24%
Age	<20	10.64%
	20 – 25	67.38%
	26 – 30	18.44%
	31 – 35	2.84%
	> 35	0.71%
	Mobile Payment	GOPAY
	OVO	20.34%
	TCASH	10.17%
	Other applications	26.55%
	Pay Pro	1.13%
	XL Tunai	2.26%

^a Source: Data collection (2018)

B. Outer Model

In the PLS-SEM method, various stages were carried out, namely, outer model analysis, inner model analysis and hypothesis determination. The first step is to analyze the outer model to assess the validity and reliability of a construct in the research model [34]. According to Hair, the validity of a construct is to measure by identifying Cronbach’s Alpha (CA) and average variance extracted (AVE) [34]. The recommended value of CA is above 0.7, whereas that of AVE above 0.5 [34]. Then, the reliability of a construct was measured using composite reliability (CR) test, whose recommended value according to Hair et al. is 0,7 [34]. The following table shows the CA, CR, and AVE values for each construct:

TABLE II. AVE, CA AND CR TEST RESULT

	AVE	CA	CR
<i>Behavioural Intention (Y)</i>	0.689	0.712	0.869
<i>Use Behaviour (Z)</i>	0.629	0.712	0.833
<i>Performance Expectancy (X1)</i>	0.730	0.877	0.915
<i>Effort Expectancy (X2)</i>	0.748	0.887	0.922
<i>Social Influence (X3)</i>	0.650	0.804	0.845
<i>Facilitating Condition (X4)</i>	0.568	0.773	0.836

^b Source: Results of SmartPLS 3.0 (2018)

Based on the calculation above the AVE value for all variables is above 0.5, which means that all of these variables have met the validity criteria. Another way to see the level of validity of a construct is to look at the value of CA which according to Hair et al. must have a value above 0.7 [34]. Based on the table above the values for all variables are above 0.7. Thus, all of these variables are valid. Then to test the construct reliability, the CR test is used. Based on the table above, the CR value is above the minimum criteria of 0.7. Thus, the three constructs are reliable.

C. Inner Model

The next step after testing the outer model is the inner model. Based on the results of calculations using SmartPLS, the values of R Square and f-Square in each construct are as follows:

TABLE III. R-SQUARE TEST RESULT

	Behavioural Intention (Y)	Use Behaviour (Z)
<i>R-Square</i>	0,510	0,632
<i>Adjusted R-Square</i>	0,490	0,205

^c Source: Results of SmartPLS 3, 2018

Based on the above calculations, the value of R-squared of the behavioural intention variable is 0.510. Thus each variable has a joint effect of 51% on the behavioural intention variable and the remaining 49% is influenced by other variables. The value of R-squared of the use behavior variable is 0.205, which means that each variable has a joint effect of 20.5% on the behavioural intention variable.

D. Hypotesis Testing

Hypothesis testing was conducted to ascertain whether the initial hypothesis of the researcher is in accordance with the results in the field. In the PLS method, hypothesis testing was conducted by identifying the P value and comparing with the specified error level. In this study, the specified error rate was 10%. If the P value is smaller than the error rate, then the hypothesis has a significant effect on hypothesis. The table describe the hypothesis test of the related variables:

TABLE IV. HYPHOTESIS TESTING

	Original Sample (O)	Sample Mean (M)	T Statistics ((O/STDEV))	P Values
<i>Performance Expectancy (X1) -> Behavioural Intention (Y)</i>	0,374	0,375	2,628	0,004
<i>Effort Expectancy_ (X2) -> Behavioural Intention (Y)</i>	0,423	0,420	3,003	0,001
<i>Social Influence_ (X3) -> Behavioural Intention (Y)</i>	0,143	0,126	1,564	0,059
<i>Facilitating Condition_ (X4) -> Use Behaviour (Z)</i>	0,219	0,261	1,694	0,045
<i>Behavioural Intention (Y) -> Use Behaviour (Z)</i>	0,401	0,397	3,627	0,000
<i>Behavioural Intention (Y) -> Use Behaviour (Z)</i>	0,401	0,397	3,627	0,000

^d Source: Results of SmartPLS 3.0 (2018)

As shown in Table 3, all the research variables have a P value below the specified error level of 10%, implying that the variables have a significant impact. The variable performance expectancy (X1) with behavioural intention (Y) has a p-value of 0.004 which means that the variable has a significant effect on behavioural intention (Y). By contrast, the statistical value for the effort expectancy variable on behavioural intention is 0.001 smaller, with an error rate of 10%. The variable facilitating condition and behavioural intention towards use behavior has a p value below the error level so the two variables have a significant influence on use behaviour. These results are in line with previous studies where behavioural intentions [5,21,29,32] and facilitating conditions [5,23,28–30] have a significant influence on use behaviour.

E. Result

Performance expectancy is defined as an individual’s belief in a particular innovation that will lead to positive results [17]. Based on statistical calculations, performance expectancy has a significant influence on behavioural intention. When users feel comfortable in using a technology, their expectations on the performance of the technology will increase [18]. This finding is supported by previous research where performance expectancy has been proven to influence behavioural intention [5,17,19,21,35]. The millennial generation is a generation that is able to broadly see opportunities. Therefore, if they assume that information systems that do not have good performance, they will not continue to use it. Thus, to attract the attention of this generation, an information system that can fulfil their need is of importance.

Effort Expectancy is the level of individual understanding of user convenience on the use of technology [21]. Based on the results of the statistical calculations using Smart PLS, effort expectancy is the most influential variable on behavioural intention. This argument is evidenced by previous research

proving that effort expectancy has a significant influence on behavioural intention [5,17,19,21]. When users feel that the use of technology is easy, the level of expectation of expectations for the good performance of the technology increases [18,22]. Mobile payments are easier to use and can assist payment processes compared with the traditional method; thus, users tend to prefer mobile payments [19]. Mobile payment users who are dominated by millennial generation demand less effort when they want to use mobile payment in their daily transaction.

Based on the results of statistical calculations using SmartPLS 3.0, Facilitating Condition is proven to have an effect on Use Behavior. Facilitating conditions have a large impact of 21%. This proves that the supporting infrastructure can increase the intensity of the use of mobile payments, especially among the military generation. When the infrastructure is ready to be used, facilitating conditions are present as a guide, assistance, and training that has been provided as a means to support information systems [28]. Some researchers also support that facilitating conditions in the context of using technology such as mobile payment, mobile banking, mobile applications and the like have an influence on behavioral intention [23,28–30].

Facilitating conditions refer to one’s trust in technical infrastructure that can support the use of technology [5,21,27]. Based on the results of statistical calculations using SmartPLS 3.0, facilitating condition has an effect on use behaviour. Facilitating conditions have a large impact of 21%. This finding proves that supporting infrastructure can increase the intensity of the use of mobile payments, especially among the millennial generation. When the infrastructure is ready to be used, facilitating conditions can be used as a guide, assistance and training to support information systems [28]. Some researchers also support that facilitating conditions in the context of using technology such as mobile payments, mobile banking and mobile applications, have an influence on behavioural intention [23,28–30].

Behavioral Intention is the readiness of individuals to perform certain behaviours and is assumed to be a behaviour that is spontaneously carried out [31]. Based on the statistical calculations using SmartPLS 3.0, behavioural intention has a significant influence on use behaviour, which is equal to 40.1%. Users who have the intention of using a mobile payment will be more likely to use mobile payment more often. The millennial generation increases their intensity of use when a mobile payment has the criteria that suffice their needs. Based on the results of the questionnaire, the average use of mobile payment is at least once a week and several times a month.

IV. CONCLUSION

This research is an implementation of the UTAUT model, which was adopted from Venkatesh’s research on the use of mobile payments in Indonesia. The results of this study show that the variables in the UTAUT model have an influence on behavioural intention. Effort expectancy has the greatest influence among the other variables. Thus, the greater the comfort in using a mobile payment, the greater the intention to

continuously use it. The continues development of applications is a serious concern for cay payment developers –if they want to attract users. This study also proves that the higher a person’s intention to use mobile payment, the more likely he will use mobile payments in daily life. This argument is evidenced on the results of the questionnaire that the average use of mobile payment is at least once a week and several times a month. One of the highlights in this study is that social influence has a small impact on behavioural intention. Millennial needs an infrastructure that can supports their daily needs compared with the social impact that surrounds users. Performance expectancy has a big impact on someone’s desire to continue using mobile payments. The millennial generation is a generation that is able to see opportunities more broadly. Therefore, when they assume that information systems do not have good performance, they will not continue using the information system. Thus, an information system that can fulfil their needs is of importance to attract the attention of this generation.

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