Perceived Usage of E-Wallet among the Y Generation in Surabaya Based on Technology Acceptance Model

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Abstract: Although the government of Indonesia is building the cashless society, the number of e-wallet users are increasing slowly. E-wallet is becoming a common instrument of payments, to replace the paper-based instruments to server-based electronic money. This research aims to investigate the perceived usage of the Y Generations on e-wallet based on Technological Acceptance Model (TAM) which is a powerful model to describe single approval to the usage of a new information technology system. As a quantitative research, the data analysis is using the Partial Least Square (PLS) with the SmartPLS 3.0 software. The results show that perceived usefulness and perceived ease of use have significant positive impacts on behavioural intention to use. The behavioural intention to use brings a significant positive impact on perceived usage. However, a direct result from perceived usefulness to perceived usage shows a negative and no significant impact, meanwhile an unintended consequence from perceived usefulness to perceived usage through behavioural intention to use shows a significant positive impact. Finally, a direct effect from perceived ease of use to perceived usage shows a lower t-statistic value than an indirect effect from perceived ease of use to perceived usage through behavioural intention.

Keywords: The Y generation, technological acceptance model, perceived usefulness, perceived ease of use, behavioural intention to use, perceived usage.

Introduction

Each country has a different attitude in responding to new technology, one of which is Indonesia. As the fourth most populous country in the world, the market in Indonesia has an excellent opportunity for the development of the digital economy. Yet, as one of the emerging market countries in Asia, the government of Indonesia still needs to intervene to create a cashless society. The cashless society creation is proved by the seriousness of Bank Indonesia in accelerating the electronification of non-cash payments in various sectors. One of the policies undertaken is the imposition of non-cash payments in all existing toll highways. In other sectors, the electronification program is also expanded within the local government to support the effectiveness of the management of state finances through transparency and more efficient cash management [1]. Non-cash transactions are increasingly prevalent with the presence of e-commerce in Indonesia, such as Tokopedia, Shopee, Bukalapak, etc. The non-cash transactions have led to changes in marketing strategies at various stores from offline to online. The development of e-commerce has been responded positively by financial technology (fintech),

a company that provides electronic wallet services (e-wallet) such as Gopay, OVO, LinkAja and Dana. The e-wallet changes the concept that money stored in a leather wallet into deposited in a digital wallet inside the smartphone. Generally, fintech companies carry out a "burn money" strategy by providing attractive promotions in the form of cashbacks from various restaurants and merchants. The e-wallet has changed the payment tools for Indonesian society. The data from Bank Indonesia shows a significant increase in the amount of electronic money circulations, from 21.869.946 in 2012 to 292.299.320 in December 2019 [2]. The average age of the population who dominates the growth of E-wallet users in Indonesia is of 30.5 years old [3].

In 2020, these 30-year-old users are considered as the Y generation or millenial generation as they were born between the period of 1981 to 1999. Data from the Central Statistics Agency (BPS) show that the population of the Indonesian Y generation in 2020 will be 83 millions or 34% of the Indonesia's total population. The Y generation has the most notable influence in Indonesian businesses (at least for the next ten years), since most of the Y generation is in the productive age [4]. Most of the Y generation were born from parents with solid financial backgrounds and are prepared in a contextually wealthy environment [5].

The Y generation is also dominating the population of Surabaya, the capital city of East Java, with the largest number of electronic money users in East Java

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[6]. For the Y generation, smartphones have become an essential part of their lives. Smartphones are not only a tool to communicate (telephone and chat) but are also used to access various information and online transactions. A study in a developing country by Cheng *et al.* [7] showed that 98% of the Y generation respondents had used smartphones, but only 50% of respondents had used e-wallets, because most respondents still preferred cash payments to e-wallets.

This study will investigate the use of e-wallet as a transaction payment tool for the Y generation in Surabaya based on the framework of Technology Acceptance Model (TAM), where this model is widely used to analyze the acceptance of new technological innovation. TAM explained by Davis [8], is the most popular and influential model to describe the single reception of the use of information technology systems. TAM is used to measure information technology adoption, and it is known to be very robust theoretically and very beneficial for the identification of the reasons for user's new technology acceptance [9]. The previous researchers have persisted that TAM is a legitimate model that reflects a crucial theoretical framework for clarifying and predicting technology acceptance behavior [10]. TAM uses two fundamental beliefs in determining attitudes toward technology and actual acceptance, both of which are: perceived usefulness (PU) and perceived ease of use (PEU). PU considers that technology will be used when it can improve performance. In his article, Davis [8] defines PU as a belief that drives decision making. PU fundamentally refers to acting the work more efficiently and effectively as well as reducing the time for finishing the job. The number of users involved in using technology is determined from the extent to which technology can maximize users' performance [11]. Additionally, PEU assesses that technology will be adopted when it is less hussle of efforts in using it [12]. Davis [8] defines PEU as a person's belief in the comfort of using a system.

The primary dependent variable in developing the study of TAM is a behavioral intention to use (BIU) [8]. Referring to the behavioral intention theory of previous researchers, an individual's BIU towards e-wallet is determined by two things, namely: an individual's attitude towards the use of e-wallet and subjective norms [13]. Behavioral attitude refers to advantages and disadvantages when using e-wallet. Subjective norms refer to the use of e-wallets because of the influence of others. According to TAM, user's behavior in technology usage is determined by the intention, which is affected by the PU and the PEU. PU is shown to have a very strong influence over BIU [14]. This result confirms findings in previous studies

explaining that PU is one of the factors influencing the intention to use payment services with smartphones [15]. PU of a specific technology will cause an individual to plan using the technology. As a crucial variable, perceived value can predict consumer acceptance and continual willingness for an e-wallet. PU greatly influences the acceptance of WeChat payments [16]. This study shows the effect of perceived value in using e-wallet as the intended payment tools for generation Y. So, the hypothesis can be constructed as follows:

H1: PU (X_1) has a positive and significant impact on BIU (Z).

Besides PU, PEU is another variable that influences an individual acceptance of technology-based services in developing countries [17]. The result from Liu *et al.* [18] suggested that PEU has a significant impact over consumers' intention to use mobile payment. This study will investigate the perceived ease of use of the new technology among the Y generation that influences the behavioral intention to use e-wallet, especially seen from the easy e-wallet to use and the less effort in operating the system. The hypothesis is constructed as follows:

H2: PEU (X_2) has a positive and significant impact on BIU (Z).

PU, PEU and BIU are internal variables in TAM which are used to quantify the actual use (AU) or perceived usage of technology. On one side, BIU can be a variable predicted or assessed by PU and PEU. While on the other side, BIU is an independent variable that estimates actual usage [19]. That study is supported by Liu *et al.* [18] which states PU and PEU as two factors affecting the intention of consumer behavior in the use of technology directly. Then, BIU influences directly to the perceived usage (AU) of the system. Another study conducted by Gupta and Arora [20], inquiring users' intentions for the acceptance of mobile payment systems, shows a positive behavioral intention leading to positive use behavior toward something. From this study, it can be inferred that the higher behavioral purpose to use, the higher actual usage is. Based on the results of previous researches, this study will examine the direct and indirect impacts of BIU to AU, therefore, the hypothesess are constructed as follows:

H3: BIU (Z) has a positive and significant impact on AU (Y);
H4: BIU (Z) acts as a mediating variable from PU (X_1) to AU (Y);
H5: BIU (Z) acts as a mediating variable from PEU (X_2) to AU (Y).

Methods

Research Population and Sample

The population for this study is those who use e-wallets as a tool of payment or transactions. While the targeted population is the Y generation, who live in Surabaya. This research uses a nonprobability sampling technique with a purposive sampling method. This sampling method is chosen because the information is expected from a specific target group The respondents' criteria for this study are as follows:

(1) Generation Y with birth years 1980-2000. (2) Residing in the Surabaya area. (3) Have at least one e-wallet account and have paid offline transactions using e-wallet at least once.

According to Hair *et al*. [21], the minimum standard for the number of samples is ten times the number of lines for the tested structural model. The standard sample size in the estimation model in using PLS will produce a better predictive effect. Therefore, this study will use a sample size of 10 times per indicator. The indicators used in this study are 18 indicators, so the number of respondents are at least 180 respondents.

Method of Collecting Data

Data collection technique in this study is using a questionnaire, by giving a set of written statements to respondents. The respondents will select one of the most appropriate choices for the statement written in the questionnaire. The questionnaires are distributed online, by sharing the Google Form links to selected respondents. The item statements of PU and PEU are adapted from Davis [8], meanwhile the statements of BIU variable are adapted from Kucukusta *et al*. [22]. The item statements for actual usage is adopted from the intensity of using e-wallet by Camilleri [14]. The measurement scale for each statement is following the Likert scale of five, from one (1) as strongly disagree to five (5) as strongly agree.

Data Analysis Technique

The analysis in this study is conducted for two purposes, namely descriptive statistic and inferential statistical analysis. Descriptive statistic explains the characteristics of respondents, especially in the assessment of research variables used in hypothesis testing. From the descriptive staatistic, this study will find the mean values that serve to clarify the scale category and facilitate the analysis of each statement. Inferential statistical analysis is used to verify the research hypothesis. This study uses smartPLS 3.0 software to process the data. The steps taken in the analysis technique include conducting a measurement model test (the outer model), conducting a structural model test (the inner model), and hypothesis and mediation testing.

Results and Discussions

Descriptive Statistics Analysis of Respondents

The research questionnaires obtained were 216 questionnaires, but 32 of them were not in accordance with established criteria, so as many as 184 questionnaires could be further processed. From the valid questionnaires, 109 respondents (59.2%) were male, and 75 respondents (40.8%) were female. Based on the year of birth, the respondents were grouped as follows: 1980–1985 (9.8%), 1986–1990 (14.1%), 1991–1995 (28.8%), and 1996–2000 (27.3%). Based on the frequency of e-wallet usage for transactions during the past month, it was found that most respondents had e-wallet balance top-up frequency of 1–3 times during the past month (48.4%). The profile of respondents based on their employment status revealed that 72 respondents were students, 109 respondents were employees, entrepreneurs, housewives, and three respondents were unemployment. The data also showed that the monthly income of most respondents was in the range of Rp. 3.500.000 - Rp. 6.000.000 (45.1%) and followed by an income range of less than Rp. 3.500.000 (33.7%).

Table 1 shows the mean value of all answers from respondents for the indicator of PU, which is 4.399 and belongs to the category of very useful with a standard deviation of 0.703. The result indicates that the respondents feel the usefulness of e-wallets in making payment transactions. The highest mean value of PU variable is 4.582, which is the indicator of "usefulness in payment transactions". The mean value indicates that the respondents feel e-wallet very useful for doing transactions. The e-wallet users do not need to carry a large amount of cash, instead they only need to bring a smartphone with a proper balance in the e-wallet for doing transactions.

Table 2 shows the mean value obtained from respondents' answers for the PEU variable, which is 4.378 and belongs to the category of very easy to use with a standard deviation of 0.650. The result suggests that the respondents in this study consider e-wallets as very easy to use in making payment transactions. PEU explains the extent to which an innovation is considered not difficult to understand, learn, or operate. The highest mean value of 4.554 belongs to the indicator of "ease to use". The mean value shows that the respondents find no problem in using the system.

Table 3 shows the overall mean value of BIU is 4.196 and the standard deviation is 0.770. The BIU can be

Table 1. Descriptive statistical analysis of PU (X_1)

Indicator	Answer					Mean	Std. Dev.	Exp.
	SD	D	QA	A	SA			
Transaction payment speed	0	2	15	66	101	4.440	0.689	very useful
Improved transaction payment performance	0	3	19	71	91	4.359	0.731	very useful
Increased productivity of payment transactions	0	5	29	83	67	4.147	0.777	useful
Increased effectiveness of payment transactions	0	1	20	78	85	4.337	0.688	very useful
Ease of making payment transactions	0	3	9	59	113	4.527	0.667	very useful
Use in payment transactions	0	0	6	65	113	4.582	0.555	very useful
Mean and standard deviation PU						4.399	0.703	very useful

Table 2. Descriptive statistical analysis of PEU (X_2)

Indicator	Answer					Mean	Std. Dev.	Exp.
	SD	D	QA	A	SA			
Ease of learning to operate	0	1	5	85	93	4.467	0.580	very easy to use
Ease of use as desired	0	2	17	87	78	4.315	0.683	very easy to use
Clarity and resolution	0	0	17	92	75	4.310	0.631	very easy to use
Interaction flexibility	0	2	29	77	75	4.212	0.783	easy to use
Ease of mastering	0	0	6	97	81	4.408	0.554	very easy to use
Ease of use	0	0	8	65	111	4.554	0.578	very easy to use
Mean and standard deviation PEU						4.378	0.650	very easy to use

Table 3. Descriptive statistical analysis of BIU (Z)

Indicator	Answer					Mean	Std. Dev.	Exp.
	SD	D	QA	A	SA			
Willingness to use e-wallet in the future	0	4	28	79	73	4.201	0.772	high
Willingness to regularly use e-wallet in the future	0	3	30	89	62	4.141	0.738	high
Willingness to recommend to others	1	2	29	71	81	4.245	0.794	very high
Mean and standard deviation BIU						4.196	0.770	high

categorized has high value. The result indicates that the respondents have a high intention to use the e-wallet for making payment transactions. The highest mean of 4.245 belongs to the indicator of "willingness to recommend to others." This indicates that the respondents are willing to recommend to others after they have experienced the usefulness and ease of use from e-wallet as a payment instrument.

Table 4 shows the perceived usage has an overall mean value of 3.969, and a standard deviation of 0.859. It belongs to the high category. The result indicates that the actual use of e-wallet among the Y generation as payment instruments is high. However, the actual use of e-wallet can still be increased to a very high category as the main payment instrument.

Partial Least Square Analysis

For Partial Least Square (PLS) analysis, there are two steps for analysis: the outer model and the inner model. The outer model gives results for the validity and reliability tests. The validity test goes through two stages, namely convergent validity, and discriminant validity. Taherdoost [23] states that convergent validity is often used in behavioral sciences. This parameter is useful for measuring the relationship between two constructs. In this current validity test, the value of the loading factor is above the standard value of 0.7 [21] which can be observed in Table 5. Therefore, all indicators comply with the convergent validity requirement.

The second stage of the validity test is the discriminant validity. The verification of the discriminant validity can be regarded as the main part of the measurement process, if they accurately confirm the diversity between measures [24]. This test is conducted by comparing the square root of Average Variance Extracted (AVE) of a perticular construct with the other correlated constructs. In Table 6, the value of each construct is higher compared to its correlated constructs, so all variables comply with the discriminant validity requirement [21].

After validity tests, the next test is the reliability test. According to Taherdoost [23], the reliability test shows that a measurement will surrender consistant results when the research is carried out repeatedly. In PLS, the reliability test is seen from the composite reliability value and the Cronbach's alpha value.

Table 7 shows the values of the composite reliability for each variable, which are greater than 0.7, and the values of Cronbach's alpha, which are greater than 0.6. According to Hair *et al.*[21], a research can be said

Table 4. Descriptive statistical analysis of AU (Y)

Indicator	Answer					Mean	Std. Dev.	Exp.
	SD	D	QA	A	SA			
The intensity of checking e-wallet balances	2	10	45	83	44	3.859	0.879	high
The intensity of top-up e-wallet balances	2	6	28	100	48	4.011	0.801	high
The intensity of payment transactions using e-wallet	2	8	31	82	61	4.038	0.881	high
Mean and Standard Deviation AU						3.969	0.859	high

Table 5 Convergent validity

Indicator	Perceived usefulness (X_1)	Perceived ease of use (X_2)	Behavioral intention to use (Z)	Perceived usage (Y)
PU1	0.767			
PU2	0.745			
PU3	0.760			
PU4	0.798			
PU5	0.747			
PU6	0.730			
PEU1		0.770		
PEU2		0.801		
PEU3		0.782		
PEU4		0.713		
PEU5		0.744		
PEU6		0.779		
BIU1			0.911	
BIU2			0.917	
BIU3			0.818	
AU1				0.812
AU2				0.911
AU3				0.852

Table 6. Discriminant Validity

Variable	Perceived usefulness	Perceived ease of use	Perceived usage	Behavioral intention to use
Perceived Usefulness	0.758			
Perceived Ease of Use	0.605	0.765		
Perceived Usage	0.406	0.487	0.859	
Behavioral Intention to Use	0.582	0.542	0.59	0.883

as reliable, if the composite reliability value is greater than or equal to 0.7. Therefore, all variables fulfill the requirement for the composite reliability.

Finally, the inner model gives the result for the coefficient of determination (R^2). The value of R^2 is used to quantify the level of variation in the changes of the independent variable to the dependent variable. R^2 is used as a measure of the explanatory power of the model [21]. High R^2 values are needed for better predictions of users' behavior, perceptions and intentions. The R^2 values of this study indicate that PU and PEU influence BIU of 0.395 or 39.5%, while PU, PEU, and BIU influence AU of 0.388 or 38.8%.

Result of the Hypothesis Test

Table 9 resumes the results of the hypothesis testing performance of this study. When the value of the t-statistic is greater than 1.96, the hypothesis is accepted.

The first hypothesis, which states perceived usefulness (X_1) having a positive and significant impact on BIU (Z), is accepted as the T-statistic shows the value of 4.383, greater than 1.96. This study confirms that the intention to use e-wallet as the payment instrument among the Y generation in Surabaya is affected by the perceived usefulness. The Y generation perceives e-wallets as very useful transactional payments, as shown in Table 1, as a result, this perception makes the Y Generation switch from cash transactions to non-cash transactions. The finding of this study aligns with some previous studies by Camilleri [13]; Susanto *et al.* [15]; Abdullah *et al.* [10]; and Upadhyay and Jahanyan [25]. The positive influence of the path coefficient in Figure 1 shows the causal relationship between perceived usefulness (X_1) and behavioral intention to use (Z). It means that the higher the perception of usefulness, the higher the intention to use the e-wallet as the payment instruments among the Y generation in Surabaya.

Table 7. Composite reliability

Variable	Composite reliability	Cronbach's Alpha
Perceived usefulness	0.890	0.852
Perceived ease of use	0.895	0.859
Behavioral intention to use	0.914	0.858
Perceived usage	0.894	0.822

Table 8. R-Square

Variable	R-Square
Behavioral intention to use	0.395
Perceived usage	0.388
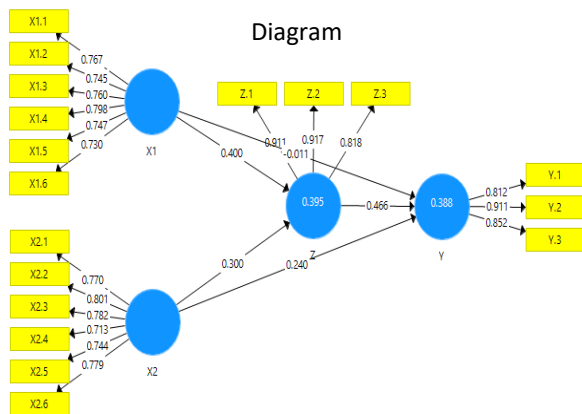
Figure 1. Output

The second hypothesis, which states perceived ease of use (X_2) having a positive and significant impact on behavioral intention to use (Z), is accepted because the T-statistic shows the value of 3.514, greater than 1.96. The perception of the ease to use is able to influence the intention of the Y generation to use e-wallet as the payment instrument. As shown in Table 2, the overall mean of perceived ease of use (X_2) is 4.378, which indicates the Y generation having no difficulties in using e-wallet in transactional payments. The convenient payment process with e-wallet motivates the high intention to use among the Y generation in Surabaya. The hypothesis test result also shows the positive path coefficient of 0.300, which means per-

ceived ease of use having a positive impact on behavioral intention to use. The higher the perception of ease, the higher the intention to use e-wallets among the Y generation. The finding of this study is in accordance with other previous studies. Researches conducted by Davis [8]; Abdullah *et al.* [10]; Liu *et al.* [18]; Faham and Asghari [26]; Hansen *et al.* [27] found that perceived ease of use affects behavioral intention to use.

The third hypothesis, which states behavioral intention to use (Z) having a positive and significant impact on perceived usage (Y), is accepted because the T-statistic value is 5.529, greater than 1.96. This proves that the high intention, shown in Table 3, can lead to actual usage. The Y generation in Surabaya makes actual payment with e-wallet mostly for the food and beverage transactions (81.5%). Besides, the food and beverage businesses are very adaptive in implementing this technology by offering various cashbacks for the e-wallet users. The path coefficient value obtained from the original sample shows a positive value of 0.466, meaning that behavior intention to use has a positive impact on perceived usage. The higher the intention to use e-wallets, the higher the actual usage of e-wallet as payment instruments among the Y generation. This study aligns with other previous researches conducted by Gupta and Arora [20] and Arif *et al.* [28], stating that there is a positive and direct influence between behavioral intention and actual usage.

The fourth hypothesis, which states behavioral intention to use (Z) acting as a mediator from perceived usefulness (X_1) to perceived usage (Y), is accepted because the T-statistic shows the value of 3.069, greater than 1.96. The results in Table 9 show that the direct path between perceived usefulness and perceived usage has a coefficient of -0.011 and a statistical value of 0.113. This means that there is a negative and insignificant impact between perceived usefulness and perceived usage. The result is supported by a research by Hussein [29], stating that perceive useful-

Table 9. Resume of the hypothesis testing output

	Original sample	Sample mean	Standard deviation	T-statistic
Path coefficients				
Perceived usefulness → Perceived usage	-0.011	-0.009	0.098	0.113
Perceived ease of use → Perceived usage	0.240	0.245	0.088	2.734
Perceived usefulness → Behavioral intention to use	0.400	0.409	0.091	4.383
Perceived ease of use → Behavioral intention to use	0.300	0.296	0.085	3.514
Behavioral intention to use → Perceived usage	0.466	0.469	0.084	5.529
Indirect effects				
Perceived usefulnes → Perceived usage	0.187	0.194	0.061	3.069
Perceived ease of use → Perceived usage	0.140	0.137	0.043	3.238

ness is not a significant predictor that influences individual to use a new technology. However, the indirect effect between perceived usefulness and perceived use through behavior intention to use shows a coefficient of 0.187 and a T-statistic value of 3.069, indicating a positive and significant impact through a mediating variable. This proves that behavioral intention to use acts as a mediating variable (full mediation).

The fifth hypothesis, which states behavioral intention to use (Z) acting as a mediating variable from perceived ease of use (X₂) to perceived usage (Y), is accepted because the T-statistic value is 3.238, greater than 1.96. The finding of this study supports a research by Singh *et al.* [30], stating that ease of use has a significant effect on users' intentions and intention to use has a significant effect on recommendation to others to use mobile payment services. The indirect effect from perceived ease of use and perceived usage shows a coefficient of 0.140, meanwhile the direct effect from perceived ease of use and perceived usage shows a coefficient of 0.240. This result shows that the direct effect has a greater impact than the indirect effect. The behavioral intention to use only acts as a complementary partial mediation in the relation between perceived ease of use and perceived usage. The convenient use of e-wallet has already triggered the Y generation to use as payment instruments. The role of behavioral intention to use, such as cashbacks and discounts, does not bring a strong impact to the actual use of e-wallet for the Y generation in Surabaya.

Conclusion

This study is to investigate the actual use of e-wallet among the Y generation in Surabaya. The results show that perceived usefulness and perceived ease of use have positive and significant impacts on behavioral intention to use, and behavioral intention to use has a positive and significant impact on actual use. Perceived ease of use also has a positive and significant impact on perceived usage. However, perceived usefulness has a negative and insignificant impact on perceived usage. With the mediation of behavioral intention to use, perceived usefulness has a positive and significant impact on perceived usage of e-wallet as the payment instruments among the Y generation in Surabaya.

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