The Technology Acceptance Model of Mobile Payment Usage on Generation Z

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How to Cite: Kristina, N., & Harris, I. (2020). The Technology Acceptance Model of Mobile Payment Usage on Generation Z. *Binus Business Review, 11*(3), 149-156. https://doi.org/10.21512/bbr.v11i3.6394

ABSTRACT

The research aimed to support Technology Acceptance Model (TAM) theories such as Perceived Ease of Use (PEOU), Security (SECU), Brand Loyalty (BL), Behavioural Intention (BI), and the marketing models, Electronic Word of Mouth (EWOM), on the use of mobile payments of the Generation Z. The researchers used the quantitative method. Using a non-probability sampling method with a convenience sampling technique, there were 100 respondents of Generation Z. The data were then analyzed using Structural Equation Modeling (SEM) with Partial Least Square (PLS). The results show that PEOU has no significant effect on BI. SECU and BL affect BI significantly. Then, BI has a significant impact on EWOM. It means that PEOU is not an important factor for Generation Z to use mobile payment. SECU and BL make the Generation Z continue to use mobile payment without worrying about data privacy issues because BL is embedded in their mind. As a result of BI, Generation Z will do marketing in the form of EWOM to their closest friends or relatives via social media.

Keywords: Technology Acceptance Model, mobile payment, Generation Z

INTRODUCTION

In the 21st century, technological developments make it easy for all people in the world to meet the various needs of life. Particularly, online and digital transactions give efficiency in time, space, and place (Oktaviani, Astuti, & Firdiansjah, 2019). Then, the mobile payment arises from the adaptation of digital technology changes from year to year to meet consumers' needs and demands.

In 2018, according to Worldpay's 2018 Global Payments, the rise of mobile payments was very rapid. Many employers used mobile payment as one of the consumer payment solutions to improve their business income. Thus, the demand for mobile payments increased around the world (Bauto, 2019). Mobile payment is currently a trend, especially in Indonesia, as a developing country. Before the advent of mobile payment, the people make a payment with a barter system that is replaced by the currencies of each country over time. It then switches to online payments, including mobile payment (Shen & Yazdanifard, 2015).

According to Oliveira, Thomas, Baptista, and Campos (2016), mobile payment involves three parties such as consumers (those who buy goods/services only), traders (those who sell goods/services only), and merchant of mobile payment (such as OVO, Dana, GoPay, and others). Payment by mobile payment ties to mobile devices such as smartphones and tablets (Ramadan & Aita, 2018). According to Nielsen (2016), some countries begin to shift from physical payment in cash or centered on a credit card or bank account to a digital device that is mobile payment. So far, the mobile payment service has been used by several businesses such as public transport, fast food restaurants, and others (Taylor, 2016). The mobile payment offers many benefits to its users, such as discounts, cashback, free products, offline or online promotions, and others.

According to Ramadan and Aita (2018), mobile payment is one of the ways of doing business

in a particular area. Perceived Ease of Use (PEOU) and Brand Loyalty (BL) give positive results on Behavioural Intention (BI) (Bailey, Pentina, Mishra, & Mimoun, 2017; Ramadan & Aita, 2018). Moreover, Security (SECU) also provides positive results for previous researchers (Ramadan & Aita, 2018). Then, BI has positive results in the Electronic Word of Mouth (EWOM) (Bailey *et al.,* 2017). These positive results are supported by technological advances that have an impact on some companies to change the traditional business cash payment into the mobile payment to follow the current trend (Shen & Yazdanifard, 2015).

There is even an increase in the percentage of online payment systems using mobile payment in Indonesia. Based on the PwC survey of Global Consumer Insights (see Figure 1), in Indonesia, mobile payment is used by 47%. It increased by 9% from 38% in 2018 (PwC, 2019). This development does not escape the attention of young generations, especially Generation Z.
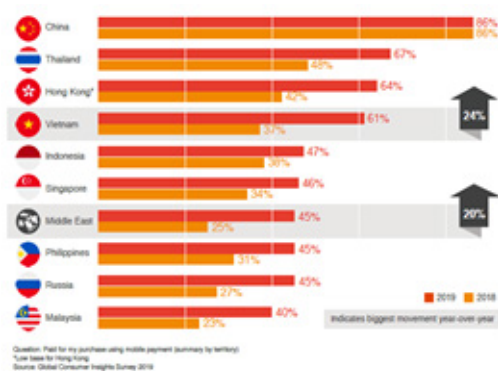

Figure 1 The Result of PwC Survey

The research is conducted to investigate mobile payment applications in Indonesia by focusing on Generation Z. Generation Z is the younger generation who follows the latest trends, especially mobile payment applications today. It can give them benefits such as discounts, cashback, free products, and others.

Generation Z is observed because of dynamic changes. Due to generational differences, each generation has a different view, experience, and response to changes in the world, especially the current economic problems (Stack, 2018). The younger generation is the most sensitive to technology development in their activities, including purchasing goods and services (Harris, 2019). Although millennials have good education, knowledge, skills, and experience, Generation Z has those better than millennials (Kristina, Venny, Vironika, & Sundiman, 2019). Generation Z is born between 1995-2010. Although various sources provide different perceptions about Generation Z, general Generation Z has begun since 1995 (Priporas, Stylos, & Kamenidou, 2019). Generation Z is more comfortable with using technology, especially mobile payment, as a payment method (Vahrenkamp, 2018).

Technology Acceptance Model (TAM) in Figure 2 is Davis's theory developed in 1989. It has undergone some changes in theories about TAM. The first theory of TAM forms a conceptual framework consisting of ease of use, perceived benefits, the behavior of the user, the intention to behave, and actual usage. The research only uses a few factors as conceptual, namely PEOU, SECU, and BI.
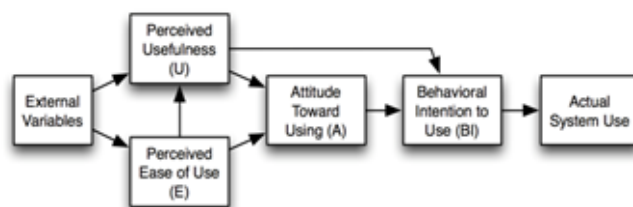

Figure 2 Technology Acceptance Model

Then, the EWOM has a tremendous effect on the survival of the company and promotion cost issues (Purwianti & Tio, 2017). According to Wang, Yeh, Chen, and Tsydypov (2016), media is widely used to perform EWOM, especially when companies want to promote mobile payment directly or indirectly by using social media. Social media is part of the technology developed, enabling consumers to search for goods or services (Febriyantoro & Arisandi, 2018; Sundiman, Wu, Mursidi, & Ting, 2019). The information that consumers want can be accessed online through social media. Social media is two-way communication in conveying the message about a product. It can be accessed and reach consumers quickly and easily (Arisandi & Pradana, 2018; Oktaviani *et al.,* 2019).

PEOU is the level of complexity related to the use and operation of technology (Chawla and Joshi, 2017). If the user does not understand the technology, it will be difficult to process information and usage procedures (Sinha, Majra, Hutchins, & Saxena, 2019). The attitude of TAM affects consumers' PEOU of mobile payment that encourages intention to behave (Bailey *et al.,* 2017; Fitriansyah & Harris, 2018; Ramadan & Aita, 2018). Then, PEOU reflects cognitive users. The mobile payment users will experience difficulties when its services are tedious and complex due to the features of the application of it. For example, the application looks unattractive and difficult to input personal data and activate pin (Wu, Liu, & Huang, 2017). So, PEOU will rise the goodwill and EWOM of its consumers in using the mobile payment. The first hypothesis is as follows.

H₁ : There is a positive relationship between PEOU and BI on EWOM for the use of mobile payment by Generation Z

The technology comfort forces mobile payment transactions to have more security layers to prevent the risk of stolen and lost personal information data

(Bauto, 2019). The mobile payment features in terms of security are needed to reduce users' concerns about financial fraud and privacy known to other parties (Fan, Shao, Li, & Huang, 2018). Personal data or privacy and perceived security are the biggest factors for users who want to use mobile payment (De Kerviler, Demoulin, & Zidda, 2016). Some users are willing to provide personal data with certain restrictions (Tiihonen & Felfernig, 2017). Then, many people are not willing to use mobile payments to conduct online transactions due to issues of personal privacy and security of user data such as finances. They can suffer losses (Mun, Khalid, and Nadarajah, 2017). Similarly, there is a negative impact on mobile payment security due to concerns that personal data can be misused by others (Bailey *et al.,* 2017). Therefore, the necessary security of the mobile payment for all users will rise the goodwill and EWOM. The second hypothesis is:

H_2 : There is a positive relationship between SECU and BI on EWOM for the use of mobile payment by Generation Z

Brands are important to be different from other companies (Choi, Ok, & Hyun, 2017). BL is the main goal of companies for certain products (Purwianti & Tio, 2017). It has a positive relationship with BI (Gordon, Zainuddin, & Magee, 2016). Taking a similar concept from Ramadan and Aita (2018), researchers will conduct BL test that significantly influences BI. Thus, the perception BL of the mobile payment application for all users will rise the goodwill and EWOM in using mobile payment. The third hypothesis is as follows:

H_3 : There is a positive relationship between BL and BI on EWOM for the use of mobile payment by Generation Z

BI can assess one's desire to perform a certain behavior (Gerhana, Irfan, & Slamet, 2017). A product benefit forms the positive attitude of the users. Then, from a positive attitude, they have the intention to use the product continuously. It can bring the effect to a marketing model that is EWOM (Purwianti & Tio, 2017). Taking a similar concept from Bailey *et al.* (2017), Duarte, Silva, and Ferreira (2018), and Purwianti and Tio (2017) regarding BI towards EWOM, the researchers expect BI will rise the goodwill and EWOM in using mobile payment. The fourth hypothesis is:

H_4 : There is a positive relationship between BI and EWOM in using mobile payment by Generation Z

The empirical relationship in the research is described by some previous researchers. The relationship between PEOU and SECU with BI is from Bailey *et al.* (2017), Nielsen (2016), and Ramadan and Aita (2018). The relationship between BL with BI is mentioned by Duarte *et al.* (2018) and Ramadan and Aita (2018). Then, the relationship between BI to EWOM is by Bailey *et al.* (2017), Oktaviani *et al.* (2019), and Purwianti and Tio (2017). Based on the empirical relationships, the research uses a conceptual framework model, as shown in Figure 3.
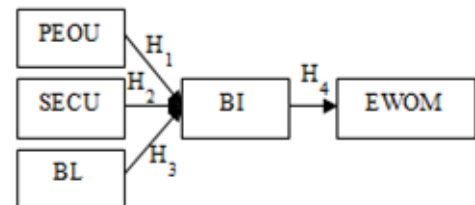

Figure 3 Conceptual Framework

The current research is based on variables that are conceived and constructed. TAM and marketing models are effective and have a significant or insignificant impact on the variables by following the results of previous studies. The problem of the research is to investigate whether PEOU, SECU, BL, BI, and EWOM affect the use of mobile payment by Generation Z. The research determines the role of PEOU, SECU, BL, and BI on Generation Z as well as the role of EWOM on their family, friends, and others through social media or other media. The research also provides insight into the mobile payment service.

The research has three main contributions. First, from a conceptual perspective, it can develop an acceptance model of mobile payment based on relevant theory on the intention to use of Generation Z. Second, testing the acceptance model on Generation Z may develop profit for mobile payment companies. Third, it can have practical implications for mobile payment companies to promote their product to Generation Z with EWOM effectively.

METHODS

The research applies a quantitative method by following Hair Jr, Sarstedt, Ringle, and Gudergan (2017), who used SmartPLS 3.0 in conducting their research. The research also conducts a hypothesis test related to the model on the use of mobile payment with PEOU, SECU, BL, BL, and EWOM on Generation Z. Based on the conceptual framework, the researchers take the samples of Generation Z as the age variable. Generation Z is people born since 1995 (Priporas *et al.,* 2019). The sampling method is a non-probability with a convenience sampling technique. Convenience sampling is used to reduce the time and effort of researchers. The researchers select respondents based on the criteria of Generation Z to provide convenience in the research.

An online questionnaire is used because it has easy access for respondents from different backgrounds and geographic locations. The researchers seek the respondents from Batam and outside of Batam (Aceh, Bali, Bandung, Jakarta, Medan, Palembang, Pekanbaru, Singkawang, Sumedang, and Yogyakarta). The respondents' confidentiality is assured that participation is voluntary, and the data are used for the research. Hair Jr *et al.* (2017) said that ten times were the largest number of structural paths directed at a particular construct in the structural model. It is ten times four structural paths from the research model ($10 \times 4 = 40$). With these requirements, the minimum respondents are 40. However, the researchers have 100 respondents who fit the criteria and provide complete data for further analysis.

The measurement of the questionnaire items of PEOU is done by two indicators by Bailey *et al.* (2017). Then, each BL and SECU has two indicators by Ramadan and Aita (2018). BI has two measurement indicators, and EWOM uses three indicators. The indicators are based on Duarte *et al.* (2018). Table 1 shows the indicators of the research variables. The variables are also measured using a Likert scale (six points) starting from 1 (strongly disagree) to 6 (strongly agree). Basically, the Likert scale starts from 1 to 10, but researchers use a six-point Likert scale to avoid respondents answering a neutral or middle value.

RESULTS AND DISCUSSIONS

Table 2 The Characteristics of the Respondents

Characteristics	Percentage
Gender	
Male	24%
Female	76%
Mobile Payment Applications	
OVO	52%
GoPay	34%
Dana	12%
Others	2%
The Average Frequency of Usage	
< 5 times	53%
5−10 times	26%
> 10 times	21%

Based on data processed from 100 respondents in Table 2, the majority of respondents are female (76%). The rest is male (24%). For age, the respondents are still in school to college, scattered randomly throughout Indonesia. The most used mobile payment application is OVO (52%). It is followed by GoPay (34%), Dana (12%), and others (2%). The average frequency of usage is < 5 times (53%), 5−10 times (26%), and > 10 times (21%).

Table 1 The Indicators of Research Variables

Statement
PEOU (Bailey *et al.,* 2017)
- Mobile payment is easy to learn and understand (Mobile payment *mudah dipelajari dan dipahami*)
- Mobile payment is easy to use (Mobile payment *mudah digunakan*)
BL (Ramadan and Aita, 2018)
- This mobile payment is my first choice (Mobile payment *ini pilihan pertama saya*)
- I will recommend this mobile payment brand to others (*Saya akan rekomendasi merk* mobile payment *ini kepada orang lain*)
SECU (Ramadan and Aita, 2018)
- Security features (personal data and pin activation) is quite safe (*Fitur keamanan (data pribadi dan pin aktivasi) yang cukup aman*)
- When I make a transaction, the mobile payment service is safe (*Ketika saya melakukan transaksi, layanan* mobile payment *cukup aman*)
BI (Duarte *et al.,* 2018)
- I will continue to use this mobile payment (*Saya akan terus menggunakan* mobile payment *ini*)
- I will not use other brands of mobile payment (*Selain* mobile payment *ini, saya tidak akan menggunakan merk* mobile payment *lainnya*)
EWOM (Duarte *et al.,* 2018)
- I will share information about this mobile payment to others (*Saya akan berbagi informasi* mobile payment *ini kepada orang lain*)
- I always read the reviews when I want to use this brand (*Saya selalu membaca review konsumen ketika ingin menggunakan merk ini*)
- I write positive things about this mobile payment (*Saya menuliskan hal-hal positif tentang* mobile payment *ini kepada orang lain*)

Table 3 shows the calculation results of the data using Structural Equation Modeling (SEM) with Partial Least Square (PLS) (PLS-SEM). It is through the stages of data validity and reliability test, the data colinearity test (Variance Inflation Factor (VIF)), R^2 test, and hypothesis test based on Hair Jr *et al.* (2017. For an indicator to be valid and reliable, it can be seen through the convergent validity consisting of three measurements. First, the loadings value is ≥ 0,70. Second, reliability indicators should be ≥ 0,50. Third, Average of Variance Extracted (AVE) should be ≥ 0,50. Then, the Internal consistency reliability comprises two measurements. The composite reliability and Cronbach's Alpha must be 0,60–0,90. The discriminant validity consists of one measurement. HTMT indicators should be ≤ 0,85. The colinearity test using VIF is to see the relationship between exogenous and endogenous variables. Measurement through the VIF shows that there is multicollinearity (VIF < 5). Next, R^2 test can explain the exogenous variables on endogenous variables with weak (0,25), medium (0,50), and strong (0,75) ratings.

Based on the tests, all indicators provided to respondents about mobile payment are valid and reliable. Moreover, there is no indication of multicollinearity between variables. In the R^2 test (see Table 4), the exogenous variables can measure and explain every endogenous variable well. With the results, the value of R^2 in BI (0,498) and EWOM (0,524) is in the moderate or medium state. It is a good measure for endogenous variables (BI and EWOM). These indicators are eligible. Thus, the criteria that can be further analyzed.

A hypothesis test is done to determine whether the hypothesis tested by the researchers is significant or insignificant. In SEM-PLS, P-values and t-statistics are identified through the bootstrapping process. The requirements of P-values is < 0.05 (significant at 5%). Meanwhile, t-statistics should be > t-table (1,96).

From Table 5, PEOU has no significant effect on BI in mobile payment for Generation Z. Thus, H_1 is rejected. The result is not in line with Bailey *et al.* (2017) and Ramadan and Aita (2018). They stated that the PEOU of mobile payment applications could improve BI in users. It may happen because many of the features in the applications must be learned and complex. The applications look unattractive and difficult to input data and activate pin. It complicates the consumers. As a result, they do not want to learn and understand furthermore (Mun *et al.,* 2017). The result is also not in line with the theory by David (development theory in 1989). PEOU does not have a significant role in BI for Generation Z. They already understand the technology and how to use it. Generation Z feels that the mobile payment application is easy to use because they have interacted with digital technology from an early age. Hence, it is easy to learn and understand without making further adoption efforts by the company.

Table 3 The Measurement Test of the Data

| Latent Variable | Indicators | Convergent Validity Reliability | | | Internal Consistency Validity | | Discriminant | Collinearity |
		Loadings	Reliability Indicator	AVE	Composite Reliability	Cronbach's Alpha	HTMT	VIF
BI	BI1	0,913	0,834	0,714	0,832	0,616	YES	1,246
	BI2	0,771	0,594					1,246
BL	BL1	0,961	0,924	0,920	0,959	0,914	YES	3,417
	BL2	0,958	0,918					3,417
EWOM	EWOM1	0,808	0,653	0,662	0,854	0,751	YES	1,312
	EWOM2	0,769	0,591					1,816
	EWOM3	0,861	0,741					2,092
PEOU	PEOU1	0,950	0,903	0,907	0,951	0,897	YES	2,952
	PEOU2	0,954	0,910					2,952
SECU	SECU1	0,956	0,914	0,919	0,958	0,913	YES	3,380
	SECU2	0,962	0,925					3,380

Table 4 R^2 Values

Variables	R^2
BI	0,498
EWOM	0,524

Table 5 Hypothesis Test

Hypothesis	Variables	Path Coefficient	T-Statistics	P-Values	Result
H_1	PEOU → BI	0,128	1,561	0,119	Insignificant
H_2	SECU → BI	0,253	2,236	0,026	Significant
H_3	BL → BI	0,430	3,748	0,000	Significant
H_4	BI → EWOM	0,724	18,867	0,000	Significant

SECU has a significant influence on BI in the use of mobile payment for Generation Z. It means H_2 is accepted. These results are consistent with previous researchers saying that security provides positive results on the use of mobile payment (Ramadan & Aita, 2018). The security also gives Generation Z comfort to purchase without worrying about the issue of misusing personal data. Hence, SECU can increase BI in Generation Z. However, Bailey *et al.* (2017), Mun *et al.* (2017), and Wu *et al.* (2017) argued that some users were worried about the personal data misusage and still hard to accept it. Security provides features such as pin activation, barcodes, OTP codes, security codes, and scans. The application also offers more security layers to the users so that the transactions they make can be safe (Ramadan & Aita, 2018).

BL influences BI significantly in the use of mobile payment for Generation Z. So, H_3 is accepted. These results are consistent with previous studies by Bailey *et al.* (2017) and Ramadan and Aita (2018). BL is an important factor for users to make payments via mobile payment and improve BI in users to use mobile payment repeatedly. As an antecedent to the intention of continuing purchases, BL can develop and test the integrative model of theory-based research factors that influence the intention of consumer behavior in using mobile payment (Ramadan and Aita, 2018). The more loyal a consumer, especially Generation Z, is, the more they use a specific brand as the first choice. They will not switch the brand due to programs or rewards from their mobile payment service providers. It suggests that the loyalty program of mobile payment, such as cashback, discounts, or promotion, can increase the incentive purchase of Generation Z.

BI has a significant influence on EWOM in the use of mobile payment for Generation Z. H_4 is accepted. It is essential to listen to opinions or read other people's reviews before making a purchase. Information shared by users will be the feedback for potential users to determine the benefits of the product (Duarte *et al.,* 2018). These results are consistent with previous research (Bailey *et al.,* 2017). BI of the users using mobile payment gives a positive result for these applications because Generation Z will recommend those to family, friends, and co-workers through social media using chat or phone (EWOM). Similarly, according to Oktaviani *et al.* (2019), the users will inform the mobile payment to potential other users through electronic communications or EWOM.

Satisfied and loyal users will write positive things about the product through social media as the power of EWOM with a star rating and comments (Sharma & Aggarwal, 2019).

CONCLUSIONS

From the analysis of SEM-PLS and the preceding discussion, the research explains some TAM variables affecting the mobile payment through EWOM on Generation Z. It can be concluded that PEOU is not an important factor for Generation Z in using mobile payment. Meanwhile, SECU and BL make Generation Z continue to use mobile payment without worrying about data privacy issues. It is because BL is embedded in their mind (brand image). As a result, Generation Z will do marketing in the form of EWOM to their closest friends or relatives via social media.

The research contributes to the basic TAM theory further in the development of dynamic technology. TAM theory must begin to incorporate marketing elements in the current era. The research also contributes to the information that service providers can fulfill the lifestyle of Generation Z in using mobile payment applications. The implications of the research can help to provide information for mobile payment companies. It can be a basis for making decisions to improve user-friendly applications and better security systems, increase consumers' loyalty with attractive loyalty programs, and use indirect marketing strategies by consumers through the power of social media. Moreover, the government's role as a regulator that helps the paradigm in the legislation regarding the use of electronic money can increase users' confidence in conducting transactions through mobile payment.

The research has several limitations. First, the number of respondents does not represent all Generation Z in Indonesia. Moreover, the decision of the respondents is also based on the criteria and selection by the researchers. Second, it is regarding the testing of limited variables. The research does not use all variables in theory. There is a possibility of other research variables that can influence the results. The research do not use all of the TAM variables because it only wants to use the basis for adopting technology through PEOU and SECU of mobile payment that can only affect users' behavior. For future research, the research can multiply the number of respondents and

use demographic factors (age, education, gender, and others), as well as geographical factors in all regions throughout Indonesia. The future research can make a comparison with millennials regarding behavior in using mobile payments.

ACKNOWLEDGEMENT

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