

Mobile Payment Adoption in Generation Z Using Extended Unified Technology Acceptance and Use of Technology

E A F Alfa'izy*¹, E Pramana², Gunawan³

^{1,3}Department of Informatics, Institut Sains dan Teknologi Terpadu Surabaya, Indonesia

²Assumption University, Bangkok, Thailand

E-mail: alfaizye@gmail.com¹

Submitted: 21 May 2023, revised: 22 June 2023, accepted: 22 July 2023

Abstract. This study investigates the possible factors determining the success of m-payment adoption in Generation Z using the basic Unified Technology Acceptance and Use of Technology (UTAUT) model based on previous research. A theoretical model derived from previous research that combines factors from the acceptance model of UTAUT with mobile payment factors (trust, perceived security, network externalities). The sample includes 735 participants from three cities in Indonesia. Structural equation models are used to analyse and develop theoretical models. Only four hypotheses can be accepted based on the analysis of the seven hypotheses proposed. Trust, perceived security, performance expectancy, and social influence positively and significantly impact behavioral intention. Meanwhile, Facilitating Conditions, Effort Expectancy, and Network Externalities are insignificant to Behavioral Intention. There are many research models for adopting m-payments, but in developing countries, including Indonesia, the cellular penetration rate is already very high. However, the acceptance of m-payments in various trade transactions is still embryonic, especially in Generation Z. Therefore, this research presents a comprehensive investigation of the factors that influence the adoption of m-payments in Generation Z in Indonesia.

Keywords: mobile payment, generation Z, UTAUT, SEM, non-banking payment.

1. Introduction

The growth of mobile technology and the high penetration of mobile internet is increasing rapidly, and most mobile users have made it an important device to support daily life activities. Due to its various functions, more and more users use their smartphones for payment transactions, which refers to mobile payments (m-payment). M-payment is a digital-based payment service for conducting financial transactions using mobile phones and wireless communication technology. Because payment systems are online and digital, m-payment can make the payment process more convenient and efficient. Users don't need a physical card or money [1].

Indonesia is the fourth largest country globally, having a population of 271.35 million in 2020. Indonesia's central statistics bureau reports that Generation Z (GenZ) dominated Indonesian society in 2020 by 27.94% [2]. East Java has the second position with a GenZ population of 9,252,385 people [3].

GenZ describes youth born between 1997 and 2012 [4]. Research conducted by Turner (2015) explores the uniqueness of the technology and the use of GenZ smartphones that dominate the generation in Indonesia [5]. It is necessary to pay close attention to the behaviour among GenZ in using m-payments.

This research was conducted because only some similar studies have been conducted in developing countries such as Indonesia [6]. This study also discusses related research questions: (a) What factors can influence users (Generation Z) in adopting payment systems m-payment? (b) Find out the relationship between these factors at the point above. (c) practical implications of points (a) and (b). many different theoretical models are proposed for m-payment adoption[7]–[14]. Still, no model can be generally accepted as an established theoretical model in terms of adopting m-payments, especially in Generation Z. Given these conditions, this research is expected to make a significant contribution towards developing a better theoretical understanding of the determinants affecting m-payment adoption in generation Z using the Unified Technology Acceptance and Use of Technology (UTAUT) model. In addition, m-payment developers can use the results of this research to develop m-payments to be more efficient for users, especially Generation Z.

2. Framework Theory and hypothesis development

Recently, many authors have explored the adoption of m-payments as a new and innovative payment method. A systematic study found that between 2014 and 2018, 54 publications on m-payment adoption research were found [15]. Of the 54 publications found, 38 were published in scientific journals, and 16 were published in proceedings.

According to Dimock (2019), Gen Z will be between 9 and 24 years old in 2021. His study sees that Gen Z grows up in an environment that is "always on" technology. Therefore, mobile technology plays an important role for the younger generation of Gen Z. Smartphones are everything, and they can do many activities using their smartphone devices [5].

This research relates to previous research on m-payments by utilizing the basic UTAUT model to analyze theoretical models [7]–[14]. Of the eight studies, several similarities are often used and quite influential, but several factors need to be confirmed due to the lack of research on these factors on m-payments. Researchers consider three factors: perceived security, trust, and network externalities. According to researchers, these three factors are very important variables to study by adding four basic variables from UTAUT to obtain the theoretical model in Figure 1. In this study, it is hoped that it can provide more significant evidence.

2.1 Unified Technology Acceptance and Use of Technology

Unified Technology Acceptance and Use of Technology, often called UTAUT, is a model created to analyze and understand the factors that influence the use of technology in a person. Venkatesh developed UTAUT as a comprehensive synthesis of previous technology acceptance research.

UTAUT has four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions, which influence behavioral intentions to use or not to use technology. We adapt these constructs and definitions from UTAUT to the context of consumer technology acceptance and use [16].

UTAUT is a theoretical technology adoption model popular for m-payment adoption studies [6]. Several existing studies have conducted research by obtaining positive and significant values, although there are differences in the factors and research results. Previous research used the UTAUT basic reference to determine respondents' acceptance of technology. Therefore, the researcher uses the same basic reference.

2.2 Structural Equation Modeling

Structural Equation Modeling (SEM) uses various models to see and analyze the relationships created between variables by conducting quantitative tests on a theoretical model hypothesized in a study. The

ultimate goal of SEM analysis itself is to determine the extent to which sample data support a theoretical model. A more complex theoretical model can be hypothesized if a data sample supports the theoretical model.

2.3 Variable models and hypotheses

Trust is the extent to which a consumer trusts a technology system. Modified the Trust-based adoption model and found that trust, directly and indirectly, impacts Behavioral Intention [14]. According to previous studies, perceived trust has been confirmed as an important factor significantly influencing m-payment adoption [8], [9], [14], [17]. Trust also has an influence on Performance Expectancy in the context of m-payments. Therefore, trust is expected to determine performance Expectancy and Behavioral Intent for adopting m-payments.

H1: Trust shows a positive and significant value to Behavioral Intention

H9: Trust shows a positive and significant value on Performance Expectancy

Performance Expectancy can be an individual's perception of using an information system to complete a task and receive good performance from the information system [16] Performance Expectancy includes system efficiency, accuracy, and speed in completing tasks [18]. With existing research, it is said that Performance Expectancy has a positive and significant impact on Behavioral Intention in the context of m-payment adoption [7], [11], [12], [14]. In the context of m-payment, the effect of Performance Expectancy on Behavioral Intention for m-payment adoption has been explored with positive results.

H2: Performance Expectancy shows a positive and significant value to Behavioral Intention

According to the Unified Theory of Acceptance and Use of Technology, Effort Expectancy is the level of ease in using a system [16]. Effort Expectancy is the most significant variable influencing Behavioral Intention to use m-payment [19]. Many m-payment studies show that Effort Expectancy positively and significantly impacts behavioural intention regarding m-payment adoption [7]. In the context of m-payment, Effort Expectancy has been explored as having a positive value in m-payment adoption. In addition, Effort Expectancy also influences Performance Expectancy.

H3: Effort Expectancy shows a positive and significant value on Behavioral Intention

H10: Effort Expectancy shows a positive and significant value on Performance Expectancy

Facilitating Condition refers to an individual's perception of the resources and support offered to carry out the behavior [18]. Facilitating conditions are the degree to which an individual perceives that an organizational and technical infrastructure exists to facilitate system use [16]. Many previous studies have shown a positive relationship between Facilitating Conditions and Behavioral Intention [11], [12] in the context of m-payments. The effect of Facilitating Conditions on Behavioral Intention for m-payment adoption has been explored to have positive results. Besides that, Facilitating Conditions also influence Effort Expectancy [12].

H4: Facilitating Condition shows a positive and significant value to Behavioral Intention

H11: Facilitating Condition shows a positive and significant value on Effort Expectancy

Social influence, according to the Unified Theory of Acceptance and Use of Technology, is how many people use the system and the beliefs of others in using it [16]. It is estimated that Social Influence is the most important and influential factor in predicting the acceptance of new technology. According to existing m-payment adoption studies, Social Influence was found to have a positive effect on Behavioral Intention to adopt m-payment technology [7]–[10], [12]–[14]. In the context of m-payments, the effect of Social Influence on Behavioral Intention to adopt m-payments has been explored to have positive results.

H5: Social Influence shows a positive and significant value on Behavioral Intention

Network Externalities refer to changes in the value of a product according to the number of users. In short, the utility of using a product increases with using the same product or a product compatible with

other users [20]. Although there has been an increase in Vendor Networks in the adoption of m-payments and the decisions of their users, there needs to be more literature on the use of m-payments that discusses Network Externalities [6]. In the context of m-payments, the Influence of Network Externalities on Behavioral Intention to adopt m-payments has been explored with positive results [9], [21].

H6: Network Externalities show a positive and significant value to Behavioral Intention

Perceived security is the extent to which a consumer feels secure in making m-payment payments. In this case, the lack of security in financial transactions has a high risk related to consumer refusal to use m-payment [22]. Previous studies have proven that Perceived Security positively impacts Behavioral Intention to adopt m-payments [10], [11], [14]. Apart from that, Perceived Security also influences trust [14]. In the context of m-payment, the Influence of Perceived Security has been explored to have a positive value on Behavioral Intention and Trust.

H7: Perceived Security shows a positive and significant value to Behavioral Intention

H8: Perceived Security shows a positive and significant value to Trust

Behavioural Intention is the main factor of user acceptance in behaviour [16]. In the context of m-payments, it measures the commitment of individuals to take advantage of m-payments if it becomes available to them as an option in the future.

2.4 Theoretical and Measurement Models

Figure 1 shows a theoretical model of factors from previous research that influence a consumer to adopt m-payment. Meanwhile, all instrument measurements used to validate the model can be seen in Table 1.

Table 1. Measuring instruments

Variables	Ind	Measurement	Reference
PE	PE1	I feel M-payment is a payment method that has many benefits.	[14]
	PE2	M-payment makes payments easier.	
	PE3	M-payment increases the efficiency of payment methods.	
	PE4	M-payment increases my speed in payments.	
EE	EE1	Learning how to use M-payments is easy	[14]
	EE2	The steps for using M-payment are easy to follow.	
	EE3	It is not difficult to become an expert in using M-payments	
	EE4	Interaction with M-payment is clear and easy to understand.	
PS	PS1	I feel safe when using M-payment.	[14]
	PS2	I feel M-payment is safe when sending sensitive information.	
	PS3	I feel safe providing personal information when using M-payment.	
TR	TR1	I believe the M-payment platform is competent and effective in handling payment transactions.	[14]
	TR2	I believe that the M-payment platform always pays attention to customers' interests.	
	TR3	I believe the M-payment platform can be trusted.	
	TR4	I believe the M-payment platform is honest with users.	
	TR5	I believe that the legal framework for M-payments adequately protects consumers.	
SI	SI1	People who are important to me (e.g. family members, close friends, and colleagues) recommend I use M-payment.	[14]
	SI2	People who matter to me find M-payments useful.	
	SI3	People who matter to me think it's best to use M-payments.	
	SI4	People who are important to me support me in using M-payment.	

Variables	Ind	Measurement	Reference
NE	NE1	The more merchants that accept M-payments will increase the quality of M-payment services.	[9]
	NE2	The more merchants that accept M-payments will make M-payment services more varied.	
	NE3	More merchants that accept M-payments can make customers pay less when using M-payment services.	
FC	FC1	I have the necessary resources to use M-payments	[8]
	FC2	I have the necessary knowledge to use M-payment.	
	FC3	M-payment is compatible with other technologies I use	
	FC4	I can get help from other people when I have trouble using M-payment	
BI	BI1	I intend to use M-payment in the future	[8]
	BI2	I will always try to use M-payment in my daily life	
	BI3	I plan to use M-payment in the future.	
	BI4	I expect to use M-payment in the future.	

3. Research Method

This cross-sectional quantitative study uses a questionnaire to collect data about the experiences of individuals using the m-payment system. This approach has been used successfully in previous m-payment studies. The design for this study followed the guidelines provided by Neuman [23].

3.1 Questionnaire distribution

Managed questionnaires have been prepared in Indonesian. The questionnaire includes two sections: the first section concerns the characteristics of the respondent (age, gender, education, m-payment platform, and monthly usage). Instructions clarified that only individuals aged 17 – 25 had used m-payments to complete the questionnaire. The second part contains questions regarding the respondent's experience using m-payments.

3.2 Measurement

The questionnaire was adapted from previous research so that its validity and reliability are better for measurement. Table 1 above describes the details of measuring eight latent variables where the analysis needs indicator size as an interval scale. Respondents stated their level of agreement using a five Likert scale ranging from 1 (strongly disagree) and 5 (strongly agree).

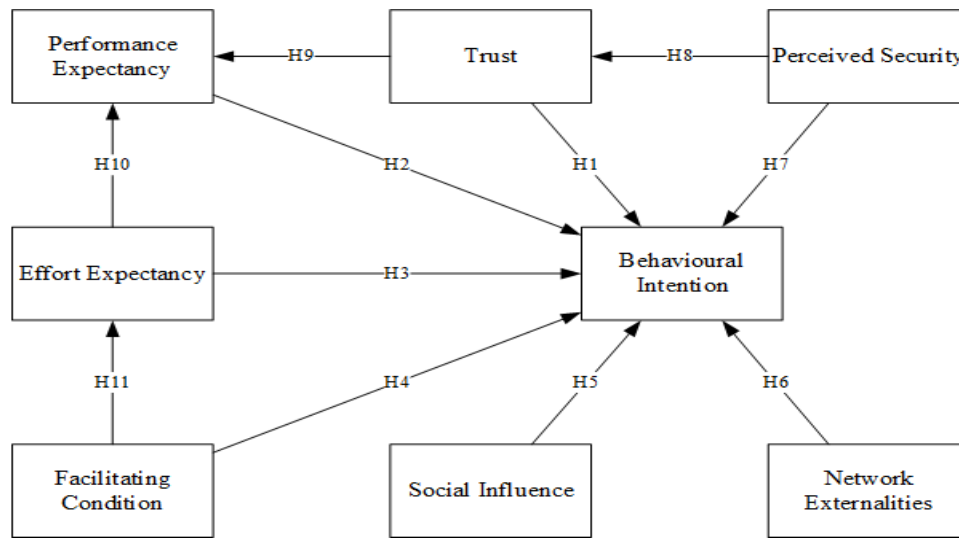


Figure 1. Theoretical model

3.3 Sample data

The target population is Generation Z Indonesia aged 17-25 years and living in urban areas in Indonesia and have used the m-payment system in Indonesia. The population size in Indonesia is unknown, but it is certain to exceed 100,000 inhabitants. With 5% precision and a 95% confidence level, the minimum specified sample size is 400 [24]. This sample size ensures the statistical validity of the research, especially when using SEM.

4. Data preparation and descriptive analysis

4.1. Data preparation

A total of 735 survey results were obtained from respondents. No errors were found in filling out the survey. If there is a missing value, it will be deleted in total. Furthermore, 147 questionnaires found at least one outlier value in the model variables, and they were removed totally. The final sample obtained was 588, which still met the minimum sample size specified for the study.

Table 2 shows the respondents' characteristics, including age, gender, education, m-payment platform, and average use of m-payments each month.

Table 2. Characteristics of Respondents

Category	Item	Frequency	Category	Item	Frequency
Age	17	59	Usage/month	1-5	125
	18	63		6-10	104
	19	62		11-15	176
	20	74		16-20	31
	21	69		21-25	104
	22	46		26-30	44
	23	68		>30	4
	24	64			
Gender	25	83	Application	Dana	244
				ShopeePay	243
	Male	356		Gopay	210
	Female	232		OVO	207

Category	Item	Frequency	Category	Item	Frequency
Education	High School	403	LinkAja	LinkAja	177
	Diploma	71		Others	2
	Bachelor	112			
	Graduate	2			
	Total	588			

The factor analysis results in Table 3 show that each group of indicators can confirm its discriminant and convergent position. During this study's factor analysis process, indicators were omitted. Thus, the next step is a reliability test using construct validity results after removing irrelevant indicators. Each group of indicators will be analysed using the Cronbach Alpha Coefficient to measure the consistency of the survey results. The minimum value of Cronbach Alpha is 0.7 according to the guidelines [25].

There are three interpretations resulting from the reliability test with Coefficient Cronbach alpha, namely "Acceptable", "Good", and "Very good". The reliability test has one variable, Facilitating Condition, whose value is .699. Because the value is close to 0.7, the researcher still includes this variable in the calculation.

Table 3. Reliability Test

Latent Variable	Indicator	Load	Alpha	Interpretation
Performance Expectancy (PE)	PE1	.621	.699	Acceptable
	PE2	.756		
	PE3	.710		
	PE4	.653		
Effort Expectancy (EE)	EE1	.760	.794	Acceptable
	EE2	.685		
	EE3	.643		
	EE4	.688		
Perceived Security (PS)	PS1	.746	.866	Good
	PS2	.766		
	PS3	.764		
Trust (TR)	TR1	.651	.853	Good
	TR2	.664		
	TR3	.666		
	TR4	.664		
	TR5	.634		
Social Influence (SI)	SI1	.728	.831	Good
	SI2	.780		
	SI3	.787		
	SI4	.692		
Network Externalities (N)	N1	.769	.792	Acceptable
	N2	.797		
	N3	.710		
Facilitating Condition (FC)	FC1	.741	.763	Acceptable
	FC2	.752		
	FC3	.740		
Behavioural Intention (BI)	BI1	.715	.760	Acceptable

Latent Variable	Indicator	Load	Alpha	Interpretation
	BI2	.665		
	BI3	.658		
	BI4	.731		

4.2 Descriptive analysis

Table 4 shows that the magnitude of skewness and kurtosis are within acceptable limits, namely 3 and 7, as recommended for using maximum likelihood estimation in SEM analysis [26].

Table 4. Descriptive analysis

Ind	Mean	Std	Skewness	Kurtosis	Ind	Mean	Std	Skewness	Kurtosis
PE1	4.44	.567	-.389	-.803	SI1	4.31	.674	-.638	.031
PE2	4.46	.544	-.282	-1.044	SI2	4.34	.62	-.384	-.665
PE3	4.47	.542	-.31	-1.067	SI3	4.35	.637	-.464	-.676
PE4	4.46	.578	-.511	-.688	SI4	4.31	.629	-.477	-.031
EE1	4.35	4.35	4.37	4.37	N1	4.34	.68	-.895	1.008
EE2	4.37	4.35	4.37	4.37	N2	4.35	.674	-.865	.809
EE3	4.35	4.35	4.37	4.37	N3	4.29	.74	-1.029	1.163
EE4	4.37	4.35	4.37	4.37	FC1	4.28	.67	-.468	-.471
PS1	4.27	.72	-.84	.685	FC2	4.35	.632	-.488	-.45
PS2	4.29	.72	-.864	.642	FC3	4.32	.633	-.381	-.684
PS3	4.3	.718	-.923	.918	BI1	4.4	.592	-.412	-.687
TR1	4.29	.686	-.836	.942	BI2	4.38	.594	-.371	-.685
TR2	4.31	.683	-.835	.88	BI3	4.41	.589	-.41	-.694
TR3	4.3	.69	-.847	.905	BI4	4.42	.6	-.503	-.639
TR4	4.27	.693	-.753	.638	-	-	-	-	-
TR5	4.29	.688	-.804	.763	-	-	-	-	-

5. Analysis models

Analysis was performed using Amos software. All effects are displayed in the following format. Non-standard effects will be displayed first and followed by "*", "**", "***" or NS, indicating a statistical significance level of 0.05, 0.01, 0.001, or not significant at a level of 0.05 or more. In parentheses, the standard effect is shown first, followed by an interpretation of the magnitude of the nature of the standard effect described by Cohen (1988) [27] as small (S) (less than 0.1); Moderate (M) (0.1 to less than 0.5); or Large (L) (0.5 or greater). The same notation is also used in Figure 2 (Direct effect theoretical model), and Table 5 shows the results of the statistical data on the theoretical model.

Table 5. Statistical Data Theoretical Models

Hipotesis	Path	Estimate	S.E	C.R	P-Label
H1	TR -> BI	.211	.061	3.468	***
H2	PE -> BI	.158	.068	2.324	.020
H3	EE -> BI	.105	.078	1.346	.178
H4	FC -> BI	-.095	.093	-1.029	.303
H5	SI -> BI	.117	.046	2.559	.010
H6	N -> BI	.087	.054	1.612	.107
H7	PS -> BI	.144	.069	2.102	.036

Hipotesis	Path	Estimate	S.E	C.R	P-Label
H8	PS -> TR	.663	.043	15.282	***
H9	TR -> PE	.173	.039	4.429	***
H10	EE -> PE	.382	.057	6.666	***
H11	FC -> EE	.591	.054	11.041	***

From Table 5, it can be seen that the match statistics are satisfactory, even though three causal effects are not significant. Thus, from the 11 hypotheses, eight hypotheses from the analysis results have significant results.

Table 6. Statistical model fit

N	$NC\left(\frac{\chi^2}{df}\right)$	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
588	669.721/388=1.726	.025	.930	.916	.911	.961	.961	.035
R^2 : EE (.490), TR (.585), PE (.323), BI (.495)								

The fit model value is shown in Table 6 with the following details: (a) The chi-square value is between 1-5, meaning it is still accepted; (b) GFI, NFI, IFI, and CFI values > 0.9, meaning good model fit; and (c) RMR and RMSEA values are close to 0, meaning that the model is suitable.

6. Discussion

6.1 Direct effects

Figure 2 provides statistical results for each hypothesis. Trust effect shows significant value to Behavioral Intention (H1). This shows that if an m-payment system is trustworthy, it will increase the adoption rate of that m-payment. Performance Expectancy shows a significant value on Behavioral Intention (H2). This shows that the better performance of an m-payment system affects someone adopting m-payment. Effort Expectancy shows no significant value to Behavioral Intention (H3). There are many research models for adopting m-payments, but in developing countries, including Indonesia, the cellular penetration rate is already very high. However, the acceptance of m-payments in various trade transactions is still embryonic, especially in Generation Z. Therefore, this research presents a comprehensive investigation of the factors that influence the adoption of m-payments in Generation Z in Indonesia. This shows that convenience in using m-payment does not determine someone adopting it. Facilitating Condition shows an insignificant value on Behavioural Intention (H4). In this case, the possibility is due to the lack of or poor internet network in an area still developing. Social influence shows significant results on Behavioral Intention (H5). In this case, it shows that the influence of a person in using m-payment can influence other people to participate in adopting m-payment. Network Externalities show insignificant results on Behavioral Intention (H6). This shows that the more features that payees use m-payment did not affect someone adopting m-payment. Perceived security shows significant results on Behavioral Intention (H7).

This shows that convenience in using m-payment does not determine someone adopting it. Facilitating Condition shows an insignificant value on Behavioural Intention (H4). In this case, the possibility is due to the lack of or poor internet network in an area still developing. Social influence shows significant results on Behavioral Intention (H5). In this case, it shows that the influence of a person in using m-payment can influence other people to participate in adopting m-payment. Network Externalities show insignificant results on Behavioral Intention (H6). This shows that the more features that payees use m-payment did not affect someone adopting m-payment. Perceived security shows significant results on Behavioral Intention (H7). In this case, security in a financial transaction is very

important to determine whether someone is adopting m-payment. Perceived security shows significant results on Trust (H8). This shows that the Security a user feels can increase one's trust in the system. Trust shows a significant value on Performance Expectancy (H9). This case shows that one's trust in an m-payment system can affect performance in using the m-payment. Effort Expectancy shows a significant value on Performance Expectancy (H10). In this case, one's convenience can show that the m-payment system is easy to use in transactions. Facilitating Condition shows a significant value on Effort Expectancy (H11). If a facility is sufficient, such as a network and payment media, it will increase one's comfort in using m-payment.

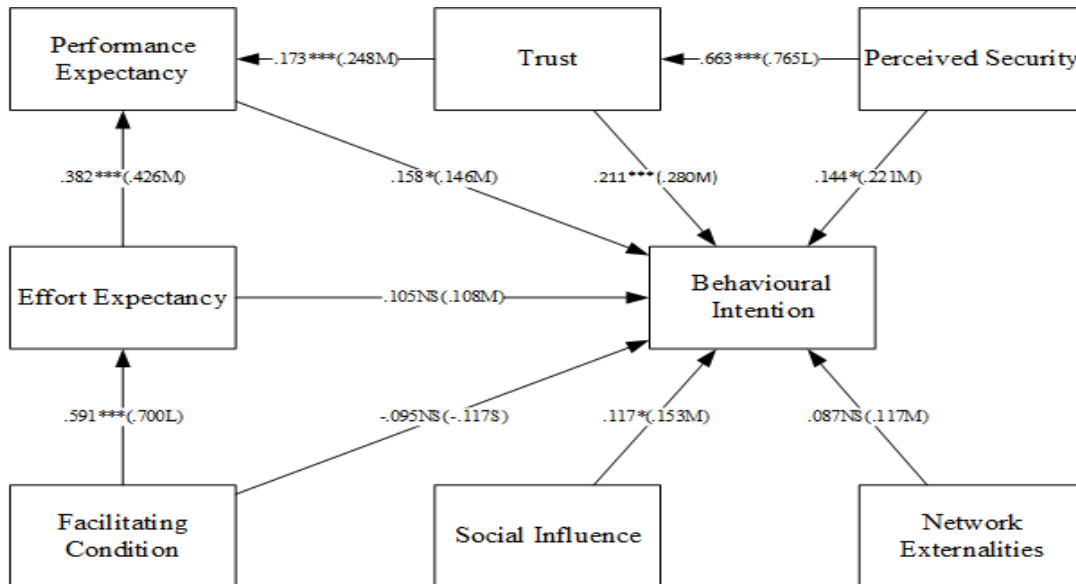


Figure 2. Direct effect theoretical model

Comprehensively, direct effect analysis shows that Trust (H1) shows the greatest effect on someone in adopting m-payments, followed by Perceived Security (H7), Social Influence (H5), and Performance Expectancy (H2). The result means that users still see the ability of the system to ensure that they do not suffer privacy and financial loss as an important aspect affecting the adoption rate of m-payments [9], including the ability of a system to meet user expectations by providing appropriate and reliable regulations to help users minimize concerns about the system's security aspects. These results align with previous research [14], [17].

As previously mentioned, this research refers to how GenZ adopts m-payments. Significantly. Someone will start adopting m-payments if a positive influence is found that affects the trust that is formed through increasing the user's perceived benefits (H1) [8], [14]. Meanwhile, the effect of Perceived Security on Trust was found to be significant (H8). This means ensuring user security can increase one's trust in adopting m-payment [14], [17]. Trust in Performance Expectancy was found to be significant (H9). In this case, there may be high trust that users can take advantage of the features an m-payment system offers [8], [14]. Effort Expectancy was found to be significant to Performance Expectancy (H10). This, with m-payment features that are easy and efficient, can make a user more comfortable using m-payment, especially for Generation Z in Indonesia [8], [14]. Facilitating Condition was found to be significant to Effort Expectancy (H11). If the facilities are sufficient to use a system, users will likely adopt m-payment [8], [14].

Effort Expectancy shows an insignificant value for Behavioral Intention, contrary to research [7], [10] which shows that Effort Expectancy shows significant results. In the opinion of Tossy, (2014), Effort

Expectancy is not significant to Behavioral Intention based on the fact that respondents have previous experience or skills in using mobile payments for several services, such as paying water and electricity bills, telephone bills, and other services that can be paid via cellular payments [28].

Facilitating Condition shows an insignificant value for Behavioral Intention, this result is contrary to research [11], [12] which shows Facilitating Condition shows significant results. The Facilitating Condition of a user could be affected by the poor quality of the internet network received. Therefore, it is necessary to carry out further research regarding Facilitating Conditions, especially GenZ in Indonesia.

Network Externalities show an insignificant value for Behavioral Intention, which aligns with research [9]. In contrast, [21] reported that the effect was significant in Jordan. However, as mentioned in the limitations of their study, they used a small sample size (only 253 participants) which may introduce some bias. Thus, the effect of network externalities on behavioral intention still needs to be explored in future studies.

6.2 Theoretical Implications

This research refers to observing the factors influencing Generation Z in adopting m-payments in Indonesia. Based on previous research to verify previous research [8], [10], [14]. Therefore, this study uses the Unified Theory of Acceptance and Use of Technology to reveal what factors influence Generation Z in adopting m-payments. This study found that trust and perceived security factors can strengthen user perceptions in adopting m-payments. Only a few studies have reported that trust directly influences behavioural intentions [8], [9], [14]. This research is in line with previous research. The Influence of Trust and Perceived Security on Behavioral Intention has a significant direct effect [8], [14]. There needs to be more research on m-payment adoption in Generation Z in developing countries like Indonesia [6], [10], [29]. Hopefully, this research can contribute to further research to clarify the factors in adopting m-payments.

6.3 Practical Implications

According to the analysis, Perceived Security and Trust have the most significant impact on m-payment adoption rates. To increase user perceptions of security, vendors must continuously inform that m-payment is a new, more reliable, secure payment method. Another strategy for developers is to provide information, such as through endorsements, sponsorships, and social networking sites. As cited by previous studies, individuals tend to follow and imitate the behaviour or suggestions of people they know and idolise [30]. Therefore, using artists as support can be a strategy to persuade certain markets to build a quality platform that is safe and reliable. Equally important, it's better to attack vendors or those interested in providing support in the form of responsive assistance in helping users who have any difficulties related to using m-payments. Therefore, creating official accounts on various popular platforms must handle each case specifically and provide a reliable and fast response when customers contact them.

Many receipts of m-payment payments in various payment transactions may not influence someone to adopt m-payment. The exception is that the store only accepts m-payment payments as the Indonesian government implements paying toll booths that must use E-Toll or E-Card.

7. Conclusion

Based on this research, the user's assessment of system security is a factor that influences a person's trust in adopting an m-payment service, followed by the benefits that users get as a result of many people adopting an m-payment service. With easy and safe features that can provide convenience to users and increase the likelihood of someone starting to adopt m-payments. However, if a poor internet network constrains a user, someone will not use the m-payment service. Therefore, internet service providers must expand and improve the quality of their services to make it easier for someone to use internet facilities.

However, this study is associated with some limitations. First, this research is limited to Indonesia's Generation Z m-payment customers. Further research can be carried out in other countries to increase the

generalization of the results. Second, the results could have demonstrated the significance of Facilitating Conditions, Effort Expectancy, and Network Externalities in customer intentions to use m-payments, as reported in many previous studies. Thus, future studies need to reexamine this effect. Third, the main study focuses on adopting m-payment platforms provided by non-banks. Future research can explore the acceptance of m-payments using service provider banks. Fourth, future research may add other variables to the theoretical model to increase explanatory power. Finally, to complement the research findings, future research should investigate Generation Z's Intention to switch to using m-payments using a qualitative approach.

References

- [1] Y. D. Handarkho, Y. Harjoseputro, J. E. Samodra, and A. B. P. Irianto, "Understanding proximity mobile payment continuance usage in Indonesia from a habit perspective," *J. Asia Bus. Stud.*, vol. 15, no. 3, pp. 420–440, Jun. 2021, doi: 10.1108/JABS-02-2020-0046.
- [2] Liputan6.com, "Infografis Gen Z Dominasi Penduduk Indonesia," *liputan6.com*, Jan. 26, 2021. <https://www.liputan6.com/news/read/4467203/infografis-gen-z-dominasi-penduduk-indonesia> (accessed Jun. 22, 2023).
- [3] D. Indonesia, "Ada 68,66 Juta Generasi Z di Indonesia, Ini Sebarannya," *DataIndonesia.id*. <https://dataIndonesia.id/varia/detail/ada-6866-juta-generasi-z-di-indonesia-ini-sebarannya> (accessed Jun. 22, 2023).
- [4] M. Dimock, "Defining generations: Where Millennials end and Generation Z begins," *Pew Res. Cent.*, vol. 17, no. 1, pp. 1–7, 2019.
- [5] A. Turner, "Generation Z: Technology and Social Interest," *J. Individ. Psychol.*, vol. 71, no. 2, pp. 103–113, 2015, doi: 10.1353/jip.2015.0021.
- [6] E. Pramana, "The Mobile Payment Adoption: A Systematic Literature Review," in *2021 3rd East Indonesia Conference on Computer and Information Technology (EIConCIT)*, Surabaya, Indonesia: IEEE, Apr. 2021, pp. 265–269. doi: 10.1109/EIConCIT50028.2021.9431846.
- [7] K. Al-Saedi, M. Al-Emran, T. Ramayah, and E. Abusham, "Developing a general extended UTAUT model for M-payment adoption," *Technol. Soc.*, vol. 62, p. 101293, Aug. 2020, doi: 10.1016/j.techsoc.2020.101293.
- [8] E. L. Anggraini and I. Rachmawati, "Analysis Factors Influencing the Adoption of Mobile Payment Using the UTAUT2 Model (A Case Study of OVO in Indonesia)," vol. 2, no. 2, p. 8, 2019.
- [9] L. Lisana, "Factors influencing the adoption of mobile payment systems in Indonesia," *Int. J. Web Inf. Syst.*, vol. 17, no. 3, pp. 0–10, Jul. 2021, doi: 10.1108/IJWIS-01-2021-0004.
- [10] L. Lisana, "Understanding the key drivers in using mobile payment among Generation Z," *J. Sci. Technol. Policy Manag.*, Aug. 2022, doi: 10.1108/JSTPM-08-2021-0118.
- [11] K. Moorthy *et al.*, "What drives the adoption of mobile payment? A Malaysian perspective," *Int. J. Finance Econ.*, vol. 25, no. 3, pp. 349–364, Jul. 2020, doi: 10.1002/ijfe.1756.
- [12] P. Patil, K. Tamilmani, N. P. Rana, and V. Raghavan, "Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal," *Int. J. Inf. Manag.*, vol. 54, p. 102144, Oct. 2020, doi: 10.1016/j.ijinfomgt.2020.102144.
- [13] M.-F. Wei, Y.-H. Luh, Y.-H. Huang, and Y.-C. Chang, "Young Generation's Mobile Payment Adoption Behavior: Analysis Based on an Extended UTAUT Model," *J. Theor. Appl. Electron. Commer. Res.*, vol. 16, no. 4, pp. 618–636, Jan. 2021, doi: 10.3390/jtaer16040037.
- [14] Y. Zhao and F. Bacao, "How Does the Pandemic Facilitate Mobile Payment? An Investigation on Users' Perspective under the COVID-19 Pandemic," *Int. J. Environ. Res. Public Health*, vol. 18, no. 3, p. 1016, Jan. 2021, doi: 10.3390/ijerph18031016.

- [15] M. Karsen, Y. U. Chandra, and H. Juwitasary, "Technological factors of mobile payment: A systematic literature review," *Procedia Comput. Sci.*, vol. 157, pp. 489–498, 2019.
- [16] Venkatesh, Morris, Davis, and Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Q.*, vol. 27, no. 3, p. 425, 2003, doi: 10.2307/30036540.
- [17] Lisana and Y. D. Handarkho, "Social aspect versus service quality in trust formation toward mobile payment adoption: a case study of Indonesia," *Asia Pac. J. Mark. Logist.*, Aug. 2022, doi: 10.1108/APJML-10-2021-0774.
- [18] Venkatesh, Thong, and Xu, "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology," *MIS Q.*, vol. 36, no. 1, p. 157, 2012, doi: 10.2307/41410412.
- [19] F. Liébana-Cabanillas, F. Muñoz-Leiva, and J. Sánchez-Fernández, "A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment," *Serv. Bus.*, vol. 12, no. 1, pp. 25–64, Mar. 2018, doi: 10.1007/s11628-017-0336-7.
- [20] M. L. Katz and C. Shapiro, "Network Externalities, Competition, and Compatibility," *Am. Econ. Rev.*, vol. 75, no. 3, pp. 424–440, 1985.
- [21] H. Qasim and E. Abu-Shanab, "Drivers of mobile payment acceptance: The impact of network externalities," *Inf. Syst. Front.*, vol. 18, no. 5, pp. 1021–1034, Oct. 2016, doi: 10.1007/s10796-015-9598-6.
- [22] P. Sunny and A. George, "Determinants of Behavioral Intention To Use Mobile Wallets—a Conceptual Model," *J. Manag. JOM*, vol. 5, no. 5, pp. 52–62, 2018.
- [23] W. L. Neuman, *Workbook for Neumann Social research methods: qualitative and quantitative approaches*. Allyn & Bacon, 2006.
- [24] G. D. Israel, "Determining sample size (Tech. Rep. No. PEOB-6)," *Fla. Univ. Fla. Inst. Food Agric. Sci.*, 2003.
- [25] D. George and P. Mallery, "SPSS for Windows step by step: A simple guide and reference. 11.0 update. wps. ablongman. com/wps/media/objects/385," *George 4answers Pdf*, vol. 549, 2003.
- [26] R. B. Kline, *Principles and Practice of Structural Equation Modeling, Fourth Edition*. Guilford Publications, 2015.
- [27] J. Cohen and D. A. Weinberg, "New York, NY," *Stat. Power Anal. Behav. Sci. 2nd Ed*, 1988.
- [28] T. Tossy, "Modelling the Adoption of Mobile Payment System for Paying Examination Fees in Tanzanian Major Cities.," *Int. J. Comput. ICT Res.*, vol. 8, no. 2, 2014.
- [29] T. Nur and R. R. Panggabean, "Factors influencing the adoption of mobile payment method among generation Z: the extended UTAUT approach," *Nur T Panggabean RR*, pp. 14–28, 2021.
- [30] Y. D. Handarkho, "The intentions to use social commerce from social, technology, and personal trait perspectives: analysis of direct, indirect, and moderating effects," *J. Res. Interact. Mark.*, vol. 14, no. 3, pp. 305–336, 2020.