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Article

SELF-EFFICACY AND PERCEIVED RISK IN GEN-Z ACCEPTANCE OF CRYPTO INVESTMENT APPLICATION PLATFORM USING TECHNOLOGY ACCEPTANCE MODEL

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ABSTRACT

The announcement of Bitcoin halving in 2024 to 2025 has caused Bitcoin prices to increase. On the other hand, Indodax, as one of the crypto transaction application platforms in Indonesia, was hacked by the Lazarus group from South Korea. In September 2024, Indodax stated that the balance of user account assets would not change. This shows that crypto is a high-risk investment element. Despite the high-risk nature, BAPPEBTI, as CoFTRA in Indonesia, noted an increase in crypto transactions during 2024 of up to 360.3% in August 2024. This data is very interesting because there was a high surge in transactions even though crypto is a high-risk investment element. This research studies this phenomenon by examining various factors that influence Gen-Z's acceptance of crypto investment applications using the Technology Acceptance Model (TAM) by adding two variables: self-efficacy and perceived risk. This study used a questionnaire with 100 respondents aged 21 to 30 years, with data processing using SEM-PLS. The results showed that all variables in TAM, self-efficacy, and perceived risk have a significant effect on intention and crypto application usage. The results of the study show that perceived ease of use is the strongest variable; users who find it easy to operate a crypto application platform will consider it a useful app. The self-efficacy variable is the fourth strongest variable, while perceived risk is the weakest variable. Based on these results, it can be concluded that Gen-Z prioritizes ease of operation in using crypto application platforms. Gen-Z also considers themselves quite skilled in operating technology because they are more familiar with the use of technology, especially with smartphones. Gen-Z is aware of the risks in investing through crypto applications, but this is not the main consideration for them in using the application. They believe that the application is safe; some of their reasons are that the government has regulated it through BAPPEBTI, application service providers have also guaranteed the security of related users, and last but not least is that the initial cost to enter crypto investment is relatively small, so they don't need to worry about losing too much.

1. INTRODUCTION

Crypto is one of the relatively new investment elements and already has its own market. Crypto is a very volatile investment element, so it is very suitable for trading activities for investors. There are various types of cryptocurrencies or coins traded on the crypto market such as Bitcoin, Binance, Ethereum, and others, so that investors can easily choose each coin that suits their portfolio. On April 20, 2024, Bitcoin announced that it would have a halving, which means it will reduce the new Bitcoin supply by 50%. The halving will take place from 2024 to 2025. It will increase market demand for Bitcoin due to the limited supply in the world crypto market, so that it will increase the price of Bitcoin. The price of Bitcoin was recorded to rise continuously after the halving announcement until September 2024 (Reku, 2024). This shows that Bitcoin, as the oldest coin in the crypto market, is still very profitable as an investment element.

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Figure 1. Bitcoin price from January 2024 to September 27, 2024
Source: primary data processed (2024)

Indonesia also has several digital application platforms that can facilitate crypto trading and investment transaction activities such as Indodax, Tokocrypto, Rekeningku, Luno, Bitocto, Pluang, and others. Badan Pengawas Perdagangan Berjangka Komoditi (BAPPEBTI) or Commodity Futures Trading Supervisory Agency (CoFTRA) noted that there was a 360.3% increase in crypto transactions in 2024 compared to 2023. January to August was recorded at IDR 149.3 trillion, which then became IDR 391.01 trillion in the same period this year. The increase in 2024 is not only limited to transactions but also to the number of investors, with a total of 20.9 million investors. This shows the enthusiasm of crypto investors in Indonesia (Beincrypto, 2024).

Although crypto investment seems safe and profitable for Indonesian people, crypto also has the same risks as other investment elements. In mid-2024, there was a hacking case by the Lazarus group from North Korea who attacked Indodax, as one of the crypto application platform developers. They managed to steal billions of crypto, but Indodax immediately carried out maintenance to prevent further losses. Indodax stated that after maintenance, the crypto asset balance did not change. Application users could still carry out trading, deposit, and withdrawal activities as usual (Teknologi, 2024). This is a quite interesting phenomenon to study, considering that Indonesian investor interest in crypto through various digital applications still continues to increase despite all those negative news such as fraud and scam cases, high market volatility internationally or nationally.

There are many studies that study investor behaviour towards crypto investment. A recent study shows that the majority of Gen-Z and Millennials are likely to invest in crypto compared to other generations. It shows that 20% of Gen-Z and 22% of Millennials are likely to invest in crypto, meanwhile only 10% of Gen-X and 5% of Boomers are likely to invest in crypto (Policygenius, 2024). Some of the reasons why Gen-Z invests in crypto are that it has a greater chance of profits, a 24-hour active market, FOMO (fear of missing out) lifestyle, and a tendency to follow other people's analysis rather than their own (Judijanto et al., 2024). Other research on a crypto application platform acceptance called PINTU used the UTAUT (Unified Theory of Acceptance and Use of Technology) model with 100 respondents from 15 years old until 35 years old. The result shows that user performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit value have a significant positive effect on user behaviour intentions to use PINTU, but this research was only restricted to one crypto application platform (Restuputri et al., 2023).

This study aims to analyze factors that influence crypto application acceptance for the Indonesian people, especially the younger generation or, as they are called, Gen-Z, by using the Technology Acceptance Model while adding two external variables, namely self-efficacy and perceived risk. Previous research shows that self-efficacy has a significant influence on intention to use the technology. As an example, a previous study on mobile applications acceptance in learning involving 619 teachers in Saudi Arabia and Pakistan showed that self-efficacy influences intention in using applications (Dahri et al., 2023). Another research shows that perceived risk has a significant influence on intention to use the technology. This was held in Thailand about digital payment application acceptance in the retail sector using 467 respondents. The result showed that perceived risk influences intention in using digital payments (Chaveesuk et al., 2021).

2. LITEATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Crypto Assets

The Indonesian government has regulated crypto through the Regulation of the Commodity Futures Trading Supervisory Agency (BAPPEBTI) Number 8 of 2021 concerning Guidelines for Organizing Physical Market Trading of Crypto Assets on Futures Exchanges (BAPPEBTI, 2021). Based on these regulations, crypto in Indonesia is not a currency used for transactions but rather an asset. Based on the definition in these regulations, crypto assets are

intangible commodities in digital form, using cryptography, information technology networks, and distributed ledgers to regulate the creation of new units, verify transactions, and secure transactions without interference from other parties, which are then traded on futures exchanges or physical crypto asset markets using electronic means by crypto investment application providers.

2.2. Technology Acceptance Model

Technology acceptance becomes an important thing along with the increasing integration between business and technology. Understanding some of the influencing factors will greatly help a business to be more focused in developing its technology so that a business's time and resources are not wasted on developing undesirable and unreliable technology for users. The Technology Acceptance Model has a purpose of analyzing how and when people or certain groups of people will embrace some technology (Chahal, 2022); (Davis, 1989). The Technology Acceptance Model consists of variables such as perceived usefulness, perceived ease of use, attitude towards using, behavioural intention, and actual use.

2.3. Perceived Ease of Use

The perceived ease of use variable is an individual's belief level that a technology is easy to use or operate (Chahal, 2022); (Ho et al., 2020); (Davis, 1989). In this study, it means the level of an individual's belief that a crypto investment application is easy to use or operate to carry out investment activities. Previous research stated that perceived ease of use affects perceived usefulness in e-learning acceptance in India by using 576 students as respondents (Chahal, 2022). Other research on mobile banking acceptance also shows a similar result (Ho et al., 2020). Based on previous results, this study proposed the following hypothesis:
Hypothesis 1: Perceived Ease of Use (PEU) affects Perceived Usefulness (PU).

2.4. Perceived Usefulness

The perceived usefulness variable is an individual's level of belief that technology usage can improve their performance (Chahal, 2022); (Ho et al., 2020); (Davis, 1989). An individual will consider a technology useful if the individual assumes that their performance will improve by using the technology. For this study, it means an individual will consider a crypto application or crypto applications platform to be useful if the application can improve their investment performance. Previous research has shown that there is a relationship between perceived usefulness and attitude towards using (Chahal, 2022). Other research on the acceptance of mobile banking in two countries, namely Vietnam and Taiwan, also shows similar things (Ho et al., 2020). Based on it, this study proposes the following hypothesis:
Hypothesis 2: Perceived Usefulness (PU) affects Attitude Toward Using (ATT).

2.5. Attitude Towards Using

Attitude is an individual's stance in carrying out an activity or behaviour; it can be either positive or negative (Chahal, 2022); (Ho et al., 2020); (Davis, 1989). The attitude towards using variable in this study refers to an individual's attitude towards crypto applications in carrying out their investment activities. Previous research has shown that the perceived ease of use variable also shows an influence on the attitude towards using variable (Chahal, 2022). Other research on the acceptance of SST (Self-Service Technologies) in budget hotels in China also showed similar results (Yang et al., 2021). Therefore, this study proposes the following hypothesis:
Hypothesis 3: Perceived Ease of Use (PEU) affects Attitude Toward Using (ATT).
Further research on SST acceptance in budget hotels with 144 respondents, mostly aged 20–29 years in China, showed that attitude towards using has an effect on behavioural intention (Yang et al., 2021). Other studies from several countries also obtained similar results (Chahal, 2022); (Ho et al., 2020). Based on previous research, the next hypothesis of this study is as follows:
Hypothesis 4: Attitude Toward Using (ATT) affects Behaviour Intention (BI).

2.6. Self-Efficacy

The self-efficacy variable is an individual's confidence level in their skills in completing certain tasks (Xu et al., 2022). For this study, it means an individual's confidence level in their skills in running and operating a crypto investment application. Previous research on the acceptance of mobile fitness applications in China using 1,066 respondents showed that self-efficacy has an effect on behavioural intention (Vinnikova et al., 2020). Other research on technology acceptance also shows similar things (Xu et al., 2022). Based on previous results, this study proposed the following hypothesis:
Hypothesis 5: Self-Efficacy (SE) affects Behaviour Intention (BI).

2.7. Perceived Risk

The perceived risk variable is the inadequacy of information, predictions, or assessments regarding the distribution of final results, or the lack of ability to control the final results (Chaveesuk et al., 2021). Perceived risk is closely related to uncertainty and unfamiliarity or new things. In this study, it means that there is insufficient information to control the final results, both for the final results of crypto investment and the final results of using crypto applications. Previous studies have shown a relationship between perceived risk and behaviour intention (Chaveesuk et al., 2021); (Seo & Lee, 2021); (Xie et al., 2021). Therefore, this study proposes the following hypothesis:

Hypothesis 6: Perceived Risk (PR) affects Behaviour Intention (BI).

2.8. Behaviour Intention

The behaviour intention variable is an indication that an individual is ready to behave in such a way (Chahal, 2022), which means in this study it is the level of readiness of an individual to adopt a crypto investment application for their investment activities. Previous studies have shown that behaviour intention affects actual use (Chahal, 2022); (Raman et al., 2022); (Chaveesuk et al., 2021). Based on previous studies, this study proposed the following hypothesis:

Hypothesis 7: Behaviour Intention (BI) affects Actual Use (AU).

2.9. Actual Use

The actual use variable is an indicator that an individual will actually do particular tasks in their daily activities. In the context of this study, it means that an individual will use a crypto investment application for their investment activities. Based on the various hypotheses, this study has proposed the research model as follows.

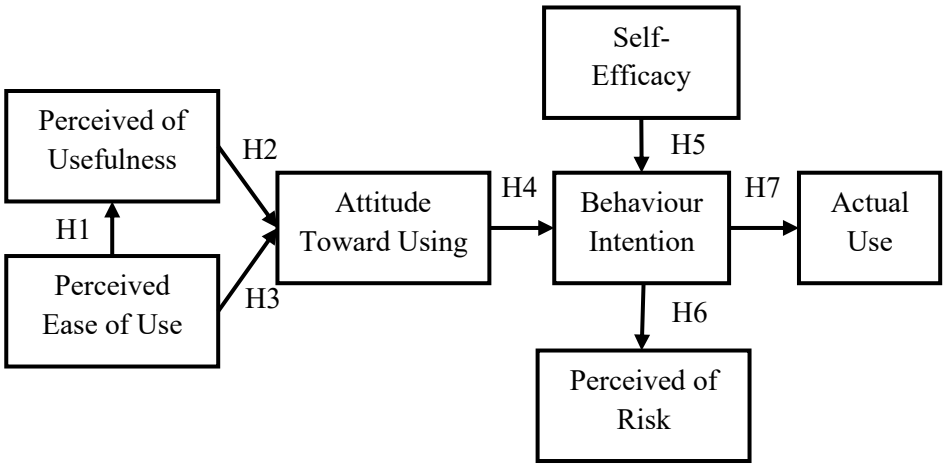

Figure 2. Research Model

3. RESEARCH METHOD

This study aims to analyse factors that influence crypto application acceptance for investment by Generation Z in Indonesia. This study uses constructs in the TAM model, namely perceived ease of use, perceived usefulness, attitude towards using, behaviour intention, and actual use, by adding two external variables, namely self-efficacy and perceived risk. Measurement for each construct uses a five-point Likert scale. The perceived usefulness variable consists of 6 questions, perceived ease of use consists of 6 questions, attitude towards using consists of 3 questions, the perceived risk variable consists of 5 questions, self-efficacy consists of 6 questions, behaviour intention consists of 5 questions, and actual usage consists of 3 questions.

Questionnaires were distributed via online by sharing questionnaire links with various respondents in several major cities in Indonesia such as Jakarta, Yogyakarta, Medan, Bandung, and Samarinda. The population of this study is all investors who are interested in crypto investment, with the criteria of investor samples being in the age range of less than 31 years, according to the Generation Z age group, both those who have used and those who are interested in using crypto applications for investment purposes. This study distributed 150 questionnaires in the period from January 10, 2024 to March 2024, with 23 respondents aged 31–40 years and 15 respondents aged over 40 years, which means they cannot be included as samples, while another 8 respondents answered but were

incomplete, so they could not be processed further. The questionnaires that could be further processed were 100 questionnaires, which became the research samples. The qualified questionnaires were then processed using Structural Equation Modelling (SEM) and analysis using Partial Least Squares (PLS) through the SmartPLS 3 statistical application.

4. RESULTS

4.1. Respondents Characteristics

Respondent's characteristics in this study were 100 respondents consisting of 23 male people with a percentage of 23.0% and 77 female people with a percentage of 77.0%. Based on the age, respondents can be grouped as follows 82 people aged ≤ 21 years with a percentage of 82.0% and respondents aged 26-30 years total 2 people with a percentage of 2.0%. Based on the last level of education, majority of respondents have high school education degree by 86 people or 86.0% and 7 people with a percentage of 7.0% with as S1 or bachelor degree as their last education degree.

Table 1. Respondent's Characteristics

Respondent's Characteristics	Category	Amount	Percentage
Gender	Male	23	23,0%
	Female	77	77,0%
Age	≤ 21 years old	82	82,0%
	22-25 years old	16	16,0%
	26-30 years old	2	2,0%
Education Degree	High School	86	86,0%
	Vocational High School	7	7,0%
	Bachelor Degree (S1)	7	7,0%
Occupation	College Students	96	96,0%
	Private Sector Employee	4	4,0%
Income per Month	< Rp 2.500.000	94	94,0%
	Rp 2.500.001-5.000.000	4	4,0%
	Rp 5.000.001-10.000.000	1	1,0%
	> Rp 10.000.000	1	1,0%

Source: primary data processed (2024).

4.2. Descriptive Statistics

This study then processes the respondent data into descriptive statistics with the aim of finding out the mean value, standard deviation, minimum value and maximum value. The results of this research processing are presented as follows.

Table 2. Descriptive Statistics

Research Variables	Mean	Standard Deviation	Minimum	Maximum
Perceived of Usefulness (PU)	3,57	0,73	1,50	5,00
Perceived Ease of Use (PEU)	3,56	0,73	1,33	5,00
Attitude Toward Using (ATT)	3,56	0,77	1,00	5,00
Self-Efficacy (SE)	3,40	0,66	1,40	5,00
Perceived Risk (PR)	3,62	0,69	1,67	5,00
Behaviour Intention (BI)	3,45	0,77	1,40	5,00
Actual Use (AU)	3,10	0,87	1,00	5,00

Source: primary data processed (2024).

Referring to table 2, perceived usefulness variable has mean value of 3.57 with a standard deviation of 0.73, maximum value 5.0 and the minimum value for this variable is 1.5. Perceived ease of use variable has mean value of 3.56 with a standard deviation of 0.73, maximum value 5.0 and minimum value 1.3. Attitude towards using variable has mean value of 3.56 with a standard deviation of 0.77, maximum value is 5.0 and minimum value is 1.0. Self-efficacy variable has mean value of 3.40 with a standard deviation of 0.66, maximum value 5.0 and minimum

value is 1.4. Perceived risk variable has mean of 3.62 with a standard deviation of 0.69, maximum value is 5.0 and minimum value is 1.67. Behaviour intention variable has mean of 3.45 with standard deviation of 0.77, maximum value is 5.0 and minimum value is 1.40. Actual use variable has mean of 3.10 with a standard deviation of 0.87, maximum value is 5.0 and minimum value for this variable is 1.0.

4.3. Structural Equation Model (SEM) Analysis

This study continues the next data processing phase by using SEM analysis through the SmartPLS program, the results of data processing using SEM are presented as follows.

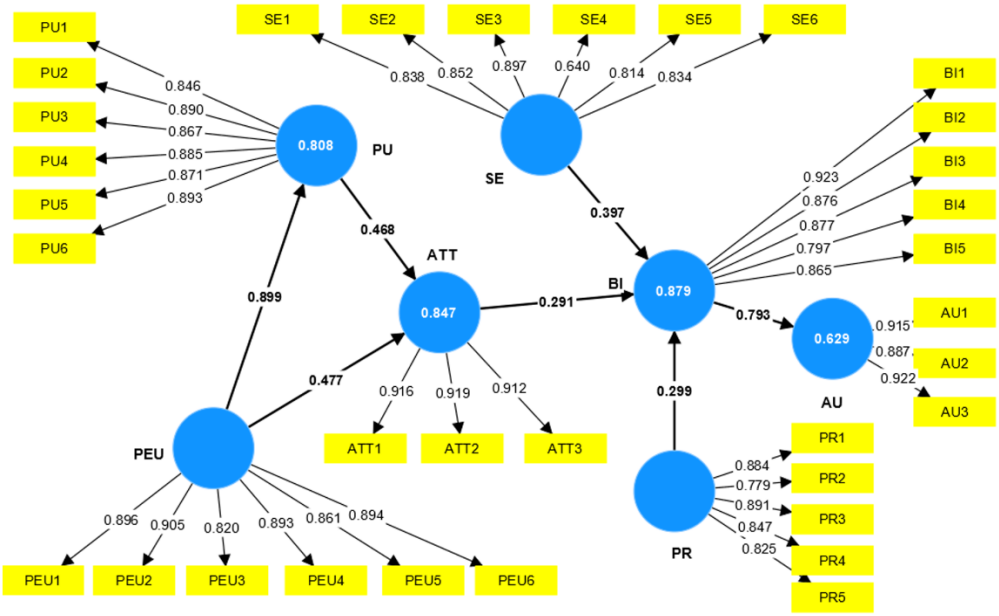

Figure 3. Path Diagram Results
Source: primary data processed (2024)

4.4. Outer Model

This study conducted an outer model test or measurement model on Perceived of Usefulness (PU), Perceived Ease of Use (PEU), Behaviour Intention (BI), Attitude Toward Using (ATT), Actual Use (AU), Self-Efficacy (SE) and Perceived of Risk (PR) variables. Figure 3 shows that outer model test results are all above 0.5 which means that the outer loading value on the indicators in each variable has met the requirements for model adequacy or Discriminant Validity.

Table 3. AVE (Average Variance Extracted)

Variables	AVE
Perceived of Usefulness (PU)	0,766
Perceived Ease of Use (PEU)	0,772
Behaviour Intention (BI)	0,755
Attitude Toward Using (ATT)	0,839
Actual Use (AU)	0,825
Self-Efficacy (SE)	0,667
Perceived of Risk (PR)	0,596

Source: primary data processed (2024).

Table 3 shows that the AVE value for all variables used in this study, namely Perceived of Usefulness (PU), Perceived Ease of Use (PEU), Behaviour Intention (BI), Attitude Toward Using (ATT), Actual Use (AU), Self-Efficacy (SE) and Perceived of Risk (PR) are greater than 0.50, which means they have good construct validity.

Table 4. Composite Reliability

Variables	Composite Reliability
Perceived of Usefulness (PU)	0,939
Perceived Ease of Use (PEU)	0,942
Behaviour Intention (BI)	0,922
Attitude Toward Using (ATT)	0,904
Actual Use (AU)	0,902
Self-Efficacy (SE)	0,912
Perceived of Risk (PR)	0,881

Source: primary data processed (2024).

Table 4 shows that all research variables, namely Perceived of Usefulness (PU), Perceived Ease of Use (PEU), Behaviour Intention (BI), Attitude Toward Using (ATT), Actual Use (AU), Self-Efficacy (SE) and Perceived of Risk (PR) have values exceeding 0.70, which means that the constructs in this study have adequate reliability.

4.5. Inner Model

This study conducted an inner model or structural model test to analyse the influence between independent variables on the dependent variables. Table 5 shows the dependent variables in this study, namely Perceived of Usefulness (PU), Behaviour Intention (BI), Attitude Toward Using (ATT), Actual Use (AU), have quite good values.

Table 5. R-Square

Variables	R-Square
Perceived of Usefulness (PU)	0,808
Attitude Toward Using (ATT)	0,847
Behaviour Intention (BI)	0,879
Actual Use (AU)	0,629

Source: primary data processed (2024).

Table 5 shows that the R-square value of the influence of the Perceived Ease of Use (PEU) variable on Perceived of Usefulness (PU) is 0.808. This means that 80.8% of the variance of the Perceived Ease of Use (PU) variable can be explained by the Perceived Ease of Use (PEU) variable, while the rest is explained by other variables outside the model. R-square value shows that the influence of the variables Perceived of Usefulness (PU) and Perceived Ease of Use (PEU) on Attitude Toward Using (ATT) is 0.847. This means that 84.7% of the Attitude Toward Using (ATT) variance variable can be explained by Perceived Usefulness (PU) and Perceived Ease of Use (PEU), while the rest is explained by other variables outside the model. Attitude Toward Using (ATT), Self-Efficacy (SE), and Perceived of Risk (PR) influence by R-square value on Behaviour Intention (BI) is 0.879. This means that 87.9% of the variance of the Behaviour Intention (BI) variable can be explained by the variables Attitude Toward Using (ATT), Self-Efficacy (SE), and Perceived of Risk (PR), while the remaining 12.1% is explained by other variables outside the model. Last but not least, Behaviour Intention (BI) variable influence by R-square value on Actual Use (AU) is 0.629. This means that 62.9% of the variance of the Actual Use (AU) variable can be explained by the Behaviour Intention (BI) variable, while the remaining 37.1% is explained by other variables outside the model.

4.6. Hypothesis Testing

This study conducted hypothesis testing by analysing at the magnitude of T statistic value on the output of the path coefficients. The limits of rejection and acceptance of the proposed hypothesis are ± 1.96, where if the t value is in the range of -1.96 and 1.96 then H0 will be rejected or in other words accept Ha. The following are the results of the path coefficient calculation obtained with the SmartPLS program.

Table 6. Results for Path Coefficient

Hypothesis	Variables	Path Coefficient	T Statistics	Hypothesis Results
H1	PEU → PU	0,899	39,551	Supported
H2	PU → ATT	0,468	4,035	Supported
H3	PEU → ATT	0,477	4,321	Supported
H4	ATT → BI	0,291	3,337	Supported
H5	SE → BI	0,397	4,607	Supported
H6	PR → BI	0,299	3,052	Supported
H7	BI → AU	0,793	16,566	Supported

Source: primary data processed (2024).

Based on Table 6, this study compiles an equation for testing the hypothesis variables. The results of the processing show that the equation table tests the hypothesis of this study as follows.

PU = 0,899PEU ..... (1)
ATT = 0,468PU + 0,477PEU ..... (2)
BI = 0,291ATT + 0,397SE + 0,299PR..... (3)
AU = 0,793BI ..... (4)

Description:
PU = Perceived Usefulness
PEU = Perceived Ease of Use
BI = Behaviour Intention
ATT = Attitude Toward Using
AU = Actual Use
SE = Self Efficacy
PR = Perceived Risk

From the equation above, it can be interpreted that equation (1) shows that the Perceived Ease of Use (PEU) variable affects positively Perceived Usefulness (PU) variable. Equation (2) shows that the Perceived of Usefulness (PU) and Perceived Ease of Use (PEU) variables affects positively Attitude Toward Using (ATT) variable. Equation (3) shows that the Attitude Toward Using (ATT), Self Efficacy (SE), and Perceived of Risk (PR) variables affects positively Behaviour Intention (BI) variable. While equation (4) shows that the Behaviour Intention (BI) variable affects positively Actual Use (AU) variable.

The next stage for this research is to continue with statistical testing by comparing the T statistic from the path coefficient results with the T table with a significance of 0.05 (T statistic> T table 1.96). If the path coefficient shows the same direction to the relationship between the hypothesis variables with T statistic> T table 1.96, then it means that it supports the research hypothesis by the existing data. Based on the results of the study, the following are the results of the analysis of the study.

Hypothesis 1 states that Perceived Ease of Use (PEU) affects Perceived Usefulness (PU). SEM analysis results show that the path coefficient influence of Perceived Ease of Use (PEU) variable on Perceived Usefulness (PU) is 0.899 with a positive T statistic value of 39.551 and greater than the T table of 1.96, which means that the hypothesis is *accepted.* This means that Perceived Ease of Use (PEU) has a positive and significant effect on the Perceived of Usefulness (PU) of crypto applications. Result shows that if users find crypto application is easy to use, then users will assume the application useful.

Hypothesis 2 states that Perceived Usefulness (PU) has a positive effect on Attitude Toward Using (ATT). SEM analysis results show that the path coefficient influence of Perceived Usefulness (PU) variable on Attitude Toward Using (ATT) is 0.468 with a positive T-statistic value of 4.035 and greater than the T table of 1.96, which means that the hypothesis is *accepted.* This means that Perceived Usefulness (PU) has a positive and significant effect on Attitude Toward Using (ATT) crypto applications. The result shows that users who feel crypto applications are useful will have a positive attitude towards crypto applications.

Hypothesis 3 states that Perceived Ease of Use (PEU) has a positive effect on Attitude Toward Using (ATT). SEM analysis result shows that path coefficient influence of Perceived Ease of Use (PEU) variable on Attitude Toward Using (ATT) is 0.477 with a positive T statistic value of 4.321 and greater than the T table of 1.96, which means that the hypothesis is *accepted*. This means that Perceived Ease of Use (PEU) has a positive and significant effect on Attitude Toward Using (ATT) crypto applications. The result shows that if users find it easy to operate crypto applications, users will have a positive attitude towards the application.

Hypothesis 4 states that Attitude Toward Using (ATT) has a positive effect on Behaviour Intention (BI). SEM analysis result shows that path coefficient influence of Attitude Toward Using (ATT) variable on Behaviour

Intention (BI) is 0.291 with a positive T statistic value of 3.337 and greater than the T table of 1.96, which means that the hypothesis is *accepted.* Attitude Toward Using (ATT) has a positive and significant effect on the Behaviour Intention (BI) of crypto applications. These results indicate that users who have a positive attitude towards crypto applications will have intention to use applications.

Hypothesis 5 states that Self Efficacy (SE) has a positive effect on Behaviour Intention (BI). SEM analysis result shows that path coefficient influence of Self Efficacy (SE) variable on Behaviour Intention (BI) is 0.397 with a positive T statistic value of 4.607 and greater than the T table of 1.96, which means that the hypothesis is *accepted.* Self-Efficacy (SE) has a positive and significant effect on Behaviour Intention (BI) of crypto applications. These results indicate that users who are confident in their skills have intention to use crypto applications.

Hypothesis 6 states that Perceived of Risk (PR) has a positive effect on Behaviour Intention (BI). SEM analysis result shows that path coefficient influence of Perceived of Risk (PR) variable on Behaviour Intention (BI) is 0.299 with a positive statistical T value of 3.052 and greater than the T table value of 1.96, which means that the hypothesis is *accepted.* This means that Perceived of Risk (PR) has a positive and significant effect on the Behaviour Intention (BI) of crypto applications. The result shows that users will have intention to use crypto applications if the crypto application have less risks.

Hypothesis 7 states that Behaviour Intention (BI) has positive effect on Actual Use (AU). SEM analysis result shows that path coefficient influence of Behaviour Intention (BI) variable on Actual Use (AU) is 0.793 with a positive T statistic value of 16.566 and is greater than the T table of 1.96, so the hypothesis is *accepted.* This means that Behaviour Intention (BI) has a positive and significant effect on Actual Use (AU) of crypto applications. The result shows that users who have intention to use crypto applications will actually use the application for their investment activities.

5. DISCUSSION

The results of this study indicate that the variable perceived ease of use (PEU) affects perceived usefulness (PU). These results are in line with previous studies that examined the acceptance of e-learning in India using 576 school students. It stated that easy e-learning operation will encourage student performance in utilising e-learning, so system developers must create an easy user interface (Chahal, 2022). Other studies on technology acceptance in the hotel and restaurant industry also have similar results (Yang et al., 2021); (Seo & Lee, 2021). Based on this, an easy user interface is a must for crypto application developers, because users will consider the application useful if the application is easy to use or operate.

This study shows that the variable perceived usefulness (PU) affects attitude towards using (ATU). This result is in line with research on mobile banking acceptance in two countries, namely Taiwan with 164 respondents and Vietnam with 213 respondents (Ho et al., 2020). Other studies also have the same results as this study (Yang et al., 2021); (Chahal, 2022). Users will have a positive view of crypto applications if users consider the application useful for their investment. Users will also give a positive view if they consider the application to be useful in helping their investment performance, such as providing information relevant to users about the crypto market, providing recommendations, and crypto market analysis.

This study shows that perceived ease of use (PEU) affects attitude towards using (ATU). The results are in line with previous research on self-service technology acceptance in the budget hotel industry in China, involving 280 customers as respondents (Yang et al., 2021). Based on these results, crypto application users will have a positive view of the application if users consider the application easy to operate and not time-consuming to understand and run.

The study results show that attitude towards using (ATU) affects behavioural intention (BI). The results of this study are in line with other studies (Yang et al., 2021); (Chahal, 2022); (Chaveesuk et al., 2021). Previous studies on mobile banking technology acceptance in Taiwan and Vietnam show that the attitude towards using variable has an influence on behavioural intention even more than other variables, namely perceived behavioural control, which means that a positive attitude towards a technology can have a stronger influence on the intention to use the technology compared to individual perceptions and beliefs (Ho et al., 2020). This study result states that crypto application providers must have the ability to create applications that are useful and easy to operate so that users have a positive attitude towards crypto applications and will be interested in using the application.

The self-efficacy (SE) variable in this study affects behavioural intention (BI). This result is in line with previous research on mHealth fitness application acceptance in China with 1,066 respondents, showing that self-efficacy and social influence affect behavioural intention. Users with high self-efficacy are more disciplined in achieving the targets set by the fitness application (Vinnikova et al., 2020). Other studies on the acceptance of mobile learning by teachers in Saudi Arabia and Pakistan also showed similar findings (Dahri et al., 2023). Based on this, it means that users who feel confident in their ability to operate crypto applications will have an intention to use crypto applications. On average, the younger generation, especially Gen-Z, have confidence in operating crypto applications because they have been familiar with technology since an early age.

The perceived risk (PR) variable in this study affects behavioural intention (BI). These results are similar to previous studies on digital payment acceptance in the retail sector with 500 respondents in Thailand (Chaveesuk et al., 2021). Several other studies also have similar results (Seo & Lee, 2021); (Xie et al., 2021). This study result shows that users have the intention to use crypto applications if they consider crypto applications to have a low risk, both in terms of user data security and privacy, investment risks, and asset theft risks in crypto applications.

This study shows that behavioural intention (BI) affects actual use (AU). This result is similar to previous research on Moodle acceptance as a mobile learning application at Universiti Utara Malaysia with 370 postgraduate students as respondents (Raman et al., 2022). This study result indicates that users who are interested in using crypto applications will actually use the application in their investment activities.

6. CONCLUSION

6.1. Conclusion

The results of this study indicate that all TAM variables, along with two external variables of self-efficacy and perceived risk, affect crypto applications acceptance. The three strongest variables in this study are, respectively, perceived ease of use, behavioral intention, and self-efficacy. These results indicate that users prioritize the ease of operating crypto applications. This must be a point of consideration for crypto application developers to design user-friendly applications, easy-to-understand user interfaces, and ease of transactions such as buying, selling, or swapping crypto in the application. The next strongest variable is behavioral intention to influence actual use, which means that interested users will actually use it in their investment activities.

The third strongest variable is self-efficacy which affects intention. The younger generation, or Gen-Z, are accustomed to using various applications on their smartphones in their daily activities. The introduction to technology and various applications from an early age makes them more familiar with various applications on smartphones, thus building self-confidence in dealing with technology. In general, they have more confidence in operating crypto applications. They only need to learn the technicalities of crypto, such as the types of crypto, how the crypto market works, and some terms in the crypto market such as spread, swap, staking, HODL, and others.

Surprisingly, the perceived risk influence on behavioral intention is considered the weakest variable in this study. Risk considerations are not the main thing for the younger generation because of several considerations, such as government regulations through BAPPEBTI which make transactions safer, then the various security features of crypto applications such as PINs, fingerprints, two-factor authentication, data encryption, and 24-hour help services that can be contacted. Furthermore, the low amount for minimum investment—several crypto application platforms have a minimum crypto transaction requirement of only IDR 10,000 or less than one US dollar—means that the younger generation or Gen-Z think that if a loss occurs, it does not have too much impact on their finances.

6.2. Limitation

Some limitations in this study include the fact that the majority of respondents are students, so they have higher self-efficacy towards technology. They have more abilities and understanding in academic fields and approaches to technology. For further research, it could involve the younger generation or Gen-Z who dropped out of school or who work in the informal sector but already have an interest in investing as respondents.

Another limitation is that the majority of respondents are still students and only a few work as private employees. The perspective of perceived risk if the majority were employees could be different because when someone has worked, they usually have their own financial priorities, and the perception of risk could be different because it means that the individual must sacrifice funds for their priority needs to invest. Not to mention the existence of data theft will have a more significant impact on the younger generation who are purely workers compared to students, although it does not rule out the possibility that there are many students who also work part-time.

6.3. Suggestion

Further research can add research variables such as the esteem needs variable, namely the desire of an individual to gain recognition from other individuals. This will be interesting considering that respondents at a young age generally still need social recognition. Further research can also add social influence variables or investigate the social environment and its influence on individual decision-making, because young people generally consider some opinions from people they respect as factors that affect their thinking or decision-making, considering that crypto and blockchain are more sophisticated investment elements and have higher risks compared to investment elements such as gold.

Some advice for crypto application developers is to develop ease of use for application development, as it is the strongest predictor of crypto application usage. This may seem like a cliché, but some apps are not as easy as they seem. The main challenge is to develop an app that is friendly or easy to use for new users, but also provides detailed data for professionals, considering that crypto users are a niche and the knowledge gap between those who

are savvy and those who are new to crypto is quite large. New users want an app that is easy for making a transaction, viewing today's profit/loss, and perhaps a simple graphical presentation to help them make future investment decisions, while more savvy users want more detailed information related to spreads, swaps, and stakes. But too much detailed information can sometimes turn off new users from learning more.

Application service providers actually also provide other channels for users to learn about crypto through social media such as Instagram, Telegram groups, or WhatsApp groups. But some new users find it a bit of a hassle to have to exit the crypto application first and then open another application to search for certain information, not to mention if the related information is in a document or chat that has already passed.

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