Cryptocurrency Exchange Application Acceptance with TAM Model in Indonesia

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Abstract

A cryptocurrency exchange application is a platform that provides a facility for users to do a crypto asset transaction. In Indonesia, there are two types of applications, regulated and unregulated apps with various and different facilities. This research aims to analyze factors that influence users' acceptance to use cryptocurrency exchange applications with extended TAM methods with 7 external variables such as design, experience, perceived risk, regulatory support, social influence, trust, and perceived benefit. Then, we analyzed the data collected using the Structural Equation Modeling (SEM) - Partial Least Square (PLS) method. This research's result was conducted to analyze and give recommendations for the next research and the apps provider regarding factors that influenced users' acceptance to use the cryptocurrency exchange application. The number of samples will be determined using a formula from Roscoe Theory with a minimum of 110 respondents and the questionnaire was filled out by 130 respondents using Google forms. This research's result has proven that trust and design are external variables that affect cryptocurrency exchange application acceptance. In contrast with the previous study in which regulatory support affects the user's trust, this research found social influence and experience are variables that affect user's trust (Albayati et al., 2020).

Keywords
TAM, Cryptocurrency, Exchange Application, Regulatory Supports, Acceptances.

1. Introduction

Cryptocurrency is one of the financial products that does not rely on banks to verify transactions, this system **is** built using blockchain technology. Blockchain will record every transaction into a "block" and at a specified time, it allows anyone and anywhere to send and receive payments. As of 2021, Indian Express Limited (Pune, 2021) estimated the total ownership rates on a global scale is at 3.9 percent on average, from the total of 300 million crypto users in the world. In addition, it estimates 18,000 businesses have opened to accept cryptocurrency as a payment. This number is rising 300% compared to several crypto ownerships in Q3 2020 based on Statista GmbH (Best, 2021).

Cryptocurrency has acquired the consideration of many individuals in the world. In Indonesia, as of 2021, Liputan6 (Pratomo, 2022) estimates 7,2 million people are the crypto owner and it has increased almost twice from last year which estimates 4 million based on katadata (Yudhistira & Mutia, 2021), As well as the total ownership, the number of transactions has increased significantly to 478,5 trillion rupiahs in July 2021 from 65 trillion rupiahs. Based on coordination meetings on the regulation of crypto assets as commodities traded on the futures exchange held by the Coordinating Ministry for Economic Affairs in Indonesia, cryptocurrency assets are still prohibited as a means of payment, but as an investment tool, they can be included as futures exchanges tradable commodities. Crypto assets will first be regulated by the Minister of Trade Regulation which includes crypto assets as commodities traded on the futures exchange under the hand of Commodity Futures Trading Regulatory Agency (BAPPEBTI - Badan Pengawas Perdagangan Berjangka Komoditi). Based on CoinMarketCap (Vermaak, 2021), the key cryptocurrency regulation in Indonesia is

- Bappebti Regulation No. 5 (2019): Bappebti identifies cryptocurrency as a commodity and establishes the regulatory requirements for cryptocurrency exchanges in Indonesia (Vermaak, 2021).
- Bappebti Regulation No. 7 (2020): Bappebti publishes a list of 229 crypto assets that can be traded legitimately on exchanges (Vermaak, 2021).

The platform that bridges transactions between crypto-assets and investors is Cryptocurrency Exchange Application. Where each cryptocurrency exchange application offers different facilities and competes to provide the best platform to serve users. Starting from features, user experience, visualization, and security level.

Due to the cryptocurrency's legal position, Indonesians can purchase crypto assets through every trading application that is registered by BAPPEBTI. There are Bitocto, Idex, Indodax, Koinku, Luno, Pintu, TRIV, Plutonext, Rekeningku, Tokocrypto, Ubit, Zipmex. Even though Indonesia's regulation has been made up to use the regulated applications under BAPPEBTI, there are several people still using global cryptocurrency exchange applications such as Detikcom (Indraini, 2021). Binance is the largest cryptocurrency exchange application in the world, they offer enhanced features and significant performance for their users. Binance has invested in 1 of the local exchange cryptocurrency apps in Indonesia, it also allows users to sign in into Tokocrypto by Binance account (Maheswari, 2021). Not only that, but legal exchange cryptocurrency apps in Indonesia have also supported deposit transaction services to Binance such as Tokocrypto, Pintu, Indodax, etc (de Best, 2021). There is their own mechanism in using global cryptocurrency applications in Indonesia (Andre Fauzi, 2021). Even with enhanced technology, cryptocurrency transactions are still rated as a high-risk investment based on Bareksa (Dewi, 2021):

1. No fundamental things that could be analyzed like their well-known currency. The exchange media is only based on cryptography without any guarantee of investment assets.
2. Drastic Rise and Fall.
3. There is no authority that forms legal regulations that can limit transactions because all transactions are controlled by Blockchain technology.
4. There is no investor protection or customer service that handles investor complaints regarding the fluctuations in the investment value.

As a platform that provides high-risk or dangerous investment, it is necessary for the platform to understand users' opinions and adoption intentions regarding cryptocurrency exchange applications. The external factors should be considered and examined for environmental features.

1.1 Objectives

The objective of this research is to understand factors that can influence users in Indonesia to use cryptocurrency exchange applications. To create the user's expected application, it will help the application provider to

1. Provides amenities for users which could increase their intention to use the application
2. Build recommendation to market the application
3. Build recommendation to gain competitive advantage

2. Literature Review

This research refers to 2 previous studies which use TAM methodology and external variables that support authors to construct the conceptual research model. The first study reference is users' trust in using blockchain technology and cryptocurrency using TAM was researched by (Albayati et al., 2020). This research's intention is to appraise the utility of blockchain innovation by researching social components that influence users' intention towards blockchain-based digital currency exchanges. This study proposes another coordination model: Technology Acceptance Model (TAM) along with new external variables such as trust, regulatory support, social influence, design, and experience that are aligned and could be implemented to research cryptocurrency exchange applications in Indonesia. However, this study did not mention their foundation to determine trust as the powerful external variable that affects users' acceptance, for better understanding, there should be a statement that clarifies why this trust is determined as a strong variable that affects users' acceptance. Aside from that, this paper did not examine the indirect effect between external variables with behavioural intention to use variables (TAM variables) so that the reader is not aware of other external variables that might affect the user's intention to use the technology.

For the second study reference was researched by (Lee, 2009) with 2 external variables including perceived benefit and perceived risk using TAM and TPB theory. The aim of this paper is to investigate and coordinate the different benefits of internet banking to form a positive component. The results show that the proposed model has good explanatory power and is easily understood by the reader, the results section is explained in detail so that the numbers listed in the table are not confusing, but it would be better if the table was given a one-sentence conclusion that represents the data so as not to seem too many paragraphs. From this study, the authors considered perceived risk and benefit as external variables for this research. For ease of understanding, Table 1 below provides a summary of the two literature reviews as follows.

Table 1. Literature Review

Authors	Research Contexts	Constructs	Fundamental Theories	Conclusion
Hayder Albayati, Kyoung Kim, Jae Jeung Rho	Blockchain Technology and Cryptocurrency	Trust, Regulatory support, Experience, Social Influence, Design	TAM	This paper's findings results shows that trust is the powerful construct that affecting user's behaviour and decision. With two strong constructs (regulatory support and experience) that influence users' trust in using blockchain-based applications. The more increases in trust, the more it will support technology adoption. This concludes the government to build user trust.
Ming-Chi Lee	Online Banking (Internet Banking)	Perceived Benefit, Perceived Risk (financial, security/privacy, performance, social and time risk)	TAM, TPB	This paper's findings results show two strong constructs (security/privacy risk and financial risk) that adversely affected users' intention to use online banking, while the three other strong constructs (perceived benefit, attitude, and perceived usefulness) positively affected users' intention to use online banking.

3. Methods

The TAM model serves as the foundation for our design framework. The TAM technique was chosen because all models were developed for user technology acceptance which has advantages over other models in terms of IT specialization, empirical support, savings, and a strong theoretical foundation (Moody, 2003). The Figure 1 below includes perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention to use as a basic variable of TAM. At the same time, there are seven additional external variables that will be investigated based on the current conditions in Indonesia and supported by several previous studies that are compatible with this research, the seven external variables include perceived benefit, perceived risk, regulatory support, experience, design, social influence, and trust.

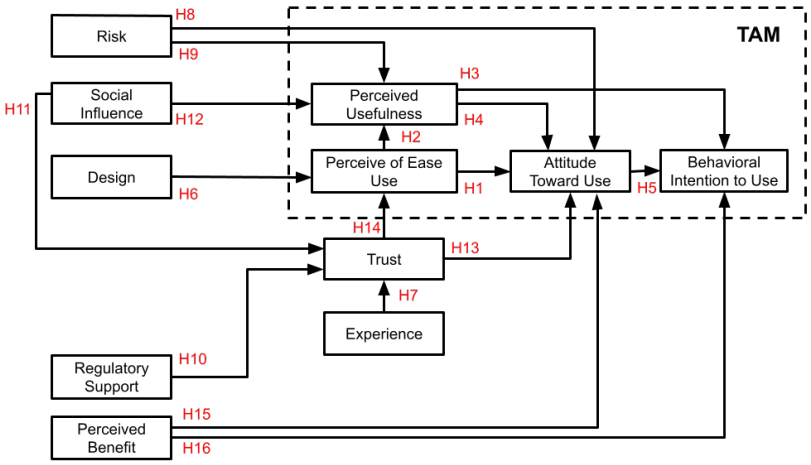

Figure 1. Conceptual.Research.Model

3.1 External Variables

1. The effects of encountering technology features such as navigation, appearance, layout, and clear information are referred to as design (Albayati et al., 2020).
2. The level of knowledge and expertise that a customer has that supports his/her use of a cryptocurrency exchange application is referred to as experience (Albayati et al., 2020).
3. Type of possibility of loss when pursuing the desired outcome referred to as perceived risk (Lee, 2009).
4. The legal framework established by the government to monitor and ensure that application providers and users' technology deliver their commitments and abstain from infractions is referred to as regulatory support (Albayati et al., 2020).
5. Individual norms, duties, affiliations effect, and values that affect users' perception toward their intention to use cryptocurrency exchange applications are referred to as social influence (Albayati et al., 2020).
6. The user's level of comfort, and confidence when utilizing technology is referred to as trust (Albayati et al., 2020).
7. Perceived benefit refers to both direct and indirect advantages. Whereas direct benefits are those that are felt directly by customers when they use cryptocurrency exchange applications, indirect benefits are those that are less tactile and more difficult to quantify (Lee, 2009).

3.2 Hypothesis

There are 16 hypotheses being researched as follows:

H1 : Perceived ease of use effects on attitude toward cryptocurrency exchange application.
H2 : Perceived ease of use effects on perceived usefulness toward cryptocurrency exchange application.
H3 : Perceived usefulness affects the behavioral intention to use cryptocurrency exchange applications.
H4 : Perceived usefulness affects the attitudes towards the use of cryptocurrency exchange applications.
H5 : Attitude toward using effects the behavioral intention to use cryptocurrency exchange application
H6 : Design affects the perceived ease of use toward cryptocurrency exchange applications.
H7 : Experience affects the user's trust for using cryptocurrency exchange application
H8 : Risk effects on attitudes towards the use of Cryptocurrency exchange application.
H9 : Risk effects on perceived usefulness of using Cryptocurrency exchange application.

H10 : Regulatory Support effects on trust toward cryptocurrency exchange application.
H11 : Social influence affects trust toward cryptocurrency exchange applications.
H12 : Social influence effects on perceived usefulness toward cryptocurrency exchange application.
H13 : Trust effects on attitude toward cryptocurrency exchange application.
H14 : Trust effects on perceived ease of use toward cryptocurrency exchange application.
H15 : Perceived benefit effects on attitude to use cryptocurrency exchange application.
H16 : Perceived benefit effects on behavioral intention to use cryptocurrency exchange application

4. Data Collection

This research conducted a quantitative method. One of the benefits of quantitative methods is that it produces reliable and factual data that can usually be generalized to several larger populations (Steckler et al., 1992). The main instrument in collecting this data was a Likert-type scale (six-point) questionnaire from strongly disagree for 1 to strongly agree for 6 on each question. This questionnaire is intended for users in Indonesia with different experiences and backgrounds in using cryptocurrency exchange applications.

The number of samples is determined by Roscoe Theory. According to Roscoe, if the study will use multivariate analysis (correlation or multiple regression), the wide variety of samples need to be at the least ten instances of the wide variety of variables analyzed (Sugiyono, 2017). This study has 11 variables, so the sample size is 11x10 = 110 respondents.

The data analysis methodology used in this research is SEM-PLS (Structural Equation Modelling - Partial Least Square). SEM-PLS is a software with a calculated method in model estimations that is intended to provide causal explanations (Hair et al., 2019).

5. Results and Discussion

5.1 Respondents

The total of respondents is 130 people, the most of their occupations were from students (66,2%) and the private sector (26,2%), while the most of the respondent's ages are between 17 and 22 years (72,2 %) and between 20 and 23 years (15,4%). Based on 130 respondents, the most used cryptocurrency exchange applications are Indodax (36,9%), Binance (25,4%), and Tokocrypto (21,5%). Indodax and Tokocrypto are legal cryptocurrency exchange applications in Indonesia. In contrast to that, Binance is an illegal or unregulated cryptocurrency exchange application in Indonesia.

5.2 Measurement Model Assessment

To assess the quality of overall research, we are concerned with the reliability and validity of the construct in the model. Reliability is assessing the measurement consistency, and validity in assessing the accuracy (Fiona Middleton, 2019). The measurements are Average Variance Extracted (AVE), Cronbach's Alpha, and Outer Loading (OL). The value of AVE must be larger than 0.5, Cronbach's alpha's value must be larger than 0.7, and Outer loading's value must be larger than 0.7 (Hair et al., 2011) but it is still accepted with a value of 0.4 – 0.7 if it does not affect the composite reliability (Sarstedt et al., 2017).

Table 2. Outer Loading Result

	Attitude Toward Use	Behavioural Intention to Use	Design	Experience	Perceived Benefit	Perceived Ease of Use	Perceived Usefullness	Regulatory Support	Risk	Social Influence	Trust
ATU1	0.827										
ATU2	0.824										
ATU3	0.899										
BITU1		0.786									
BITU2		0.846									
BITU3		0.854									
BITU4		0.858									

	Attitude Toward Use	Behavioural Intention to Use	Design	Experience	Perceived Benefit	Perceived Ease of Use	Perceived Usefullness	Regulatory Support	Risk	Social Influence	Trust
D1			0.879								
D2			0.884								
D3			0.775								
D4			0.799								
E2				0.862							
E3				0.869							
PB1					0.725						
PB2					0.890						
PB3					0.855						
PEOU1						0.891					
PEOU2						0.889					
PEOU3						0.850					
POU1							0.901				
POU2							0.869				
POU3							0.774				
RS1								0.825			
RS2								0.903			
RS3								0.696			
R1									0.810		
R2									0.903		
R3									0.686		
SI1										0.868	
SI2										0.899	
SI3										0.852	
T1											0.887
T2											0.898
T3											0.812

Table 3. Cronbach's Alpha and AVE Result

	Attitude Toward Use	Behavioural Intention to Use	Design	Experience	Perceived Benefit	Perceived Ease of Use	Perceived Usefullness	Regulatory Support	Risk	Social Influence	Trust
Cronbach's Alpha	0.809	0.856	0.856	0.716	0.765	0.850	0.805	0.726	0.752	0.848	0.835
rho_A	0.821	0.860	0.874	0.758	0.783	0.857	0.810	0.802	0.856	0.873	0.852
Composite Reliability	0.887	0.903	0.902	0.841	0.865	0.909	0.886	0.845	0.852	0.906	0.900
Average Variance Extracted (AVE)	0.724	0.699	0.698	0.641	0.683	0.769	0.722	0.647	0.660	0.763	0.751

Based on the table (Table 2 and Table 3) above, the analysis for all eleven variables is valid and reliable since all the AVE value is larger than 0.5 and the result of the Cronbach's alpha is larger than 0.6 - 0.7. Even though there are indicators that have outer loading results below 0,7, it did not make an impact on the AVE score (Hair et al., 2011).

5.3 Inner Model

This model (Figure 2) is measured using R square, T statistics, direct effect (path coefficient), indirect effect, and total effect by using PLS Algorithm & bootstrapping calculation. R square is used to measure the effectiveness of an

independent latent variable on a latent dependent variable (Hair et al., 2011). R square has a range of values from 0 to 1, the larger the value obtained, the larger the explanatory ability it has. As a guideline, the R square value of 0.75 can be considered substantial, 0.50 is considered moderate, and 0.25 is considered weak, it will be used in using and reporting results from PLS-SEM (Hair et al., 2019).

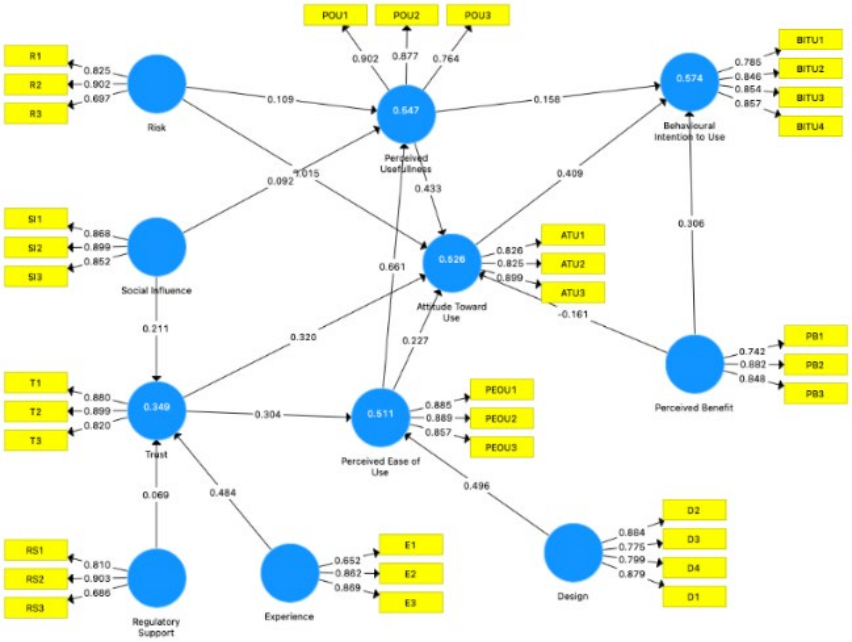

Figure 2. Research Model Result

Table 4. R Square Result

	R Square	R Square Adjusted	Description
ATU	0.526	0.507	Moderate
BITU	0.574	0.564	Moderate
PEOU	0.511	0.503	Moderate
POU	0.547	0.536	Moderate
T	0.349	0.333	Weak

From the table (Table 4) above, the endogen variable ATU R Square score is 52%, which means 52,6% from ATU is affected by T, PEOU, POU, and R, the rest (48%) is affected by the other variable. For BITU, the R Square score is 57%, it means 57% from BITU is affected by PB, ATU, and POU, the rest (43%) is affected by the other variable. For PEOU, the R Square score is 51%, which means 51% from PEOU is affected by D and the rest (49%) is affected by the other variable. For POU, the R Square score is 54,7%, which means 54,7% from POU is affected by SI and R, the rest (45,3%) is affected by the other variable. For Trust, the R Square score is 34,9%, which means 34,9% from POU is affected by RS, E, and SI, the rest (64,1%) is affected by the other variable.

T statistics and path coefficient by using bootstrapping calculation at a significant level of 5% to analyze the significance and the effect of each variable. The t-statistics result must be larger than 1.96 for the two-tailed hypothesis (Hair et al., 2011) while according to (Lehner et al., 2009), path coefficient results from -0.1 to 0.1 are considered insignificant, bigger than 0.1 are considered significant and directly proportional, smaller than 0.1 are considered significant and inversely proportional. The hypothesis result is as follows (Table. 5).

Table 5. Hypothesis Result

Hypothesis	Path Coefficient	T Statistics	Definition	Description
H1. PEOU-> ATU	0.227	1.723	Reject	PEOU is not significantly affected users' attitudes and motivate them to act positively towards cryptocurrency exchange application
H2. PEOU -> POU	0.661	10.632	Accept	PEOU shows a significant effect on POU. It means the lower the innovation intricacy level, the increase in the conviction that cryptocurrency exchange application is productive to utilize and supportive for daily needs.
H3. POU -> BITU	0.158	1.583	Reject	The usefulness of the cryptocurrency exchange applications is not really affecting the user's intention to use cryptocurrency exchange application
H4. POU -> ATU	0.443	3.717	Accept	The usefulness of cryptocurrency exchange application is significantly affected users' attitude and motivate them to act positively towards cryptocurrency exchange application
H5. ATU -> BITU	0.409	4.373	Accept	ATU has a significant effect on BITU. It is depicted that attitude has a solid constructive outcome on the user's intention to use cryptocurrency exchange application
H6. D -> PEOU	0.496	5.349	Accept	Design shows a significant effect on PEOU. It is depicted the application design increase the user's similarity experience to utilize various applications if they feel easy to use cryptocurrency exchange application.
H7. E -> T	0.484	5.611	Accept	Experience has a significant effect on trust. It is depicted that users' experience of a similar application can shape their conviction and the acknowledgment for utilizing cryptocurrency exchange applications.
H8. R -> ATU	-0.015	0.165	Reject	Risk is not significantly affected ATU. It is depicted that possibility of loss when pursuing the desired outcome in cryptocurrency exchange application is not affecting users' attitudes and motivates them to act negatively towards cryptocurrency exchange application
H9. R -> POU	0.109	1.314	Reject	Risk is not significantly affected POU. It is depicted that possibility of loss when pursuing the desired outcome in cryptocurrency exchange application is not negatively affected users' conviction that cryptocurrency exchange application is productive to utilize and supportive for daily needs.
H10. RS -> T	0.069	0.884	Reject	Regulatory support does not significantly affect the user's trust. It also aligned with the survey result that shows Binance, which is considered an illegal app in Indonesia, is number 2 with the highest usage rate.
H11. SI -> T	0.211	2.194	Accept	Social influence has a significant effect on trust. It is depicted those individual judgments and beliefs which are reflected in the opinions of others influenced their decisions and trust to utilize cryptocurrency exchange application.
H12. SI -> POU	0.092	1.500	Reject	Social influence is not significantly affected POU. It is depicted individual judgments and beliefs which are reflected in the opinions of others is not influencing conviction that cryptocurrency exchange application is productive to utilize and supportive for daily needs.

Hypothesis	Path Coefficient	T Statistics	Definition	Description
H13. T-> ATU	0.320	2.487	Accept	Trust has a significant effect on ATU. The user's attitude is essential to influence the way users behave and actions. With high trust in the application, it can motivate users to act positively towards cryptocurrency exchange applications.
H14. T -> PEOU	0.304	2.936	Accept	Trust has a significant effect on PEOU. It is depicted that trust is empowering the confidence in the innovation and builds the faith in how effective this innovation can be utilized with less exertion.
H15. PB -> ATU	-0.161	1.326	Reject	Perceived benefit is not significantly affected users' attitudes and motivate them to act positively towards cryptocurrency exchange application
H16. PB -> BITU	0.306	3.180	Accept	Perceived benefit has a significant effect on BITU. It is depicted that direct and indirect benefit has a solid constructive outcome on the user's intention to use cryptocurrency exchange application

Based on Statistikian (Hidayat, 2017), indirect effects are the indirect effects of a constructor exogenous latent variable on endogenous latent variables through an endogenous intermediary variable. The objectives of the data results are to know which external variables indirectly affected the attitude toward use and behavioral intention to use.

Table 6. Indirect Affect Result

	ATU	BITU	PEOU	POU
Design	0.254	0.156		0.328
Experience	0.231	0.110	0.147	0.097
Perceived Benefit		-0.660		
Perceived Ease of Use	0.286	0.314		
Perceived Usefulness		0.177		
Regulatory Support	0.033	0.016	0.021	0.014
Risk	0.047	0.030		
Social Influence	0.140	0.078	0.064	0.042
Trust	0.156	0.226		0.201

From the result above (Table 6), we can assume that perceived ease of use, trust, and design are the top 3 for highest indirect effects scores toward ATU and BITU while the top 3 for the lowest score are risk, regulatory support, social influence, and perceived benefit. Based on Statistikian (Hidayat, 2017), total effects are the total score of direct effects and indirect effects sum calculation. The objective is to know which variables are most affected by the variable directly and indirectly.

Table 7. Total Effects Result

	ATU	BITU	PEOU	POU	T
Attitude Toward Use		0.409			
Design	0.254	0.156	0.496	0.328	
Experience	0.231	0.110	0.147	0.097	0.484
Perceived Benefit	-0.161	0.241			
Perceived Ease of Use	0.513	0.314		0.661	
Perceived Usefulness	0.433	0.335			
Regulatory Support	0.033	0.016	0.021	0.014	0.069
Risk	0.032	0.030		0.109	
Social Influence	0.140	0.078	0.064	0.134	0.211
Trust	0.476	0.226	0.304	0.201	

From the result above (Table 7), we can assume that attitude toward use have the highest score towards user's behavioral intention to use of cryptocurrency exchange application and as well as perceived usefulness variable and perceived ease of use, while the lowest score is a risk, regulatory support, and social influence.

6. Conclusion

6.1 Inferences

Cryptocurrency exchange applications are currently widely used by users because they provide various investment needs and features. This research is using an extended TAM model with 7 external variables to determine users' intention to adopt cryptocurrency exchange applications. The finding shows:

- Risk and Social influence have an insignificant effect on perceived usefulness. Both T-statistics score is below 1,96, this result is not aligned with the previous research (Albayati et al., 2020; Lee, 2009). In contrast with that, perceived ease of use has significant effects to perceive usefulness (align with the previous research (Albayati et al., 2020).
- From the previous research, regulatory support could drive and influence the level of trust (Albayati et al., 2020), these findings also suggest a strong construct (regulatory support) that drives and influences the level of trust. However, this research shows that regulatory support has an insignificant effect on trust among Indonesia's users because the T-statistics score is below 1,96. These results also align with the condition of users in Indonesia. While Binance is an illegal application but there is still a lot of Indonesia's users using these apps, from the survey results, Binance is number 2 of the most used cryptocurrency exchange application among users' samplings.
- In contrast with regulatory support, social influence, and experience have a significant effect on trust. It shows from the T-statistics score is above 1,96 and these results align with the previous (Albayati et al., 2020).
- Perceived ease of use (PEOU) is a factor in TAM methodology. (Davis, 1989) proposed that PEOU affects the ATU (Albayati et al., 2020). This research shows that PEOU, risk, and perceived benefit have an insignificant effect on attitude toward use because the T-statistics score is below 1,96. This result is not aligned with the previous research (Davis, 1989; Lee, 2009). In contrast to the previous research, this research shows only perceived usefulness and trust that have significant effects on attitude toward use. It is also aligned with the previous research (Davis, 1989).
- Perceived usefulness is also the main factor that Davis proposed for influencing user intention to use (Davis, 1989), but this research shows that perceived usefulness has an insignificant effect on behavioral intention to use cryptocurrency exchange applications (Davis, 1989). This result is not aligned with the previous research (Davis, 1989).
- Unexpected result comes from perceived benefit. In these findings, perceived benefit negatively and have an insignificant effect towards attitude towards use of cryptocurrency exchange application contrast to the relation between perceived benefit and behavioral intention to use cryptocurrency exchange application have significant and positive impact result align with the previous research (Lee, 2009).
- The findings emphasize that trust and design have significant effects on perceived ease of use. It shows from the T-statistics score is above 1,96 and it is aligned with the previous result (Albayati et al., 2020). In addition,

trust and design also have the highest total effects score affecting users' behavioral intention to use cryptocurrency exchange applications for the external variable.

- In addition, the majority (72.2%) of respondents are aged 17-22 who do not yet have a stable financial condition that allows them to invest in crypto not continuously which can add to the bias in the results.
- In conclusion, this research contributes to the development of the TAM model with extended it with 7 external variables. Even though, there are several variables that couldn't be a strong and significant factor to determine users' intention to use and adopt cryptocurrency exchange applications.

6.2 Recommendation for next research

- The respondent of this research is mostly in the range age of 17-22. The authors recommend broadening the respondent's age type in the above range of 17-22 to determine the factors in each age group. So that we could get a varied perspective and prevent the bias results.
- Also, the author recommends having further research of other latent variables that the author has not observed, and it might be the strongest factor that influences the user to use and adopt cryptocurrency exchange applications.

6.3 Recommendation for cryptocurrency exchange application provider

From our research, trust and design are the main external factors that could influence users to use and adopt cryptocurrency exchange applications. To gain competitiveness, the first one is to increase the design quality of the application so that could ease the user to use the application. Second, increase the trust level of customers by developing a good reputation and knowledgeable application. Third, enhanced the features in the application. So that, it could impact beneficially to the user.

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Annisa Dwi Ananda is an information Systems student at Bina Nusantara University who focuses on Strategic Information Systems and currently doing an internship program as an assistant project manager at a company in Indonesia for almost one year. She oversees monitoring and managing IT projects that will support the company's business processes. As a student majoring in IS she has a high interest in technological topics and tries to keep up with current technological advances. She actively engages in technology-related seminars to broaden her knowledge. Besides that, to expand her field of competence, she also has marketing skills from her working experience at Bina Nusantara International University in 2019.

Azka Reivan Mumtaza is a final year Information Systems student at Bina Nusantara University with a specialization in Enterprise Resource Planning (ERP) and he has several SAP certifications such as Financial Accounting and Controlling, Human Capital Management, Sales and Distribution, and Procurement. During his activities as a student, Azka Reivan Mumtaza was also actively involved in several organizations as Regional President of Information Systems Student Association and President of Campus Ambassador in Bina Nusantara University. He also received several scholarships and development programs and won several national and international business competitions. In addition, to increase his knowledge, he has undertaken several projects by conducting market research and business analysis and he has experience working in several top consulting companies and top educational companies as a business consultant, technology consultant, and product manager with a total experience of approximately 2 years.

Salsabila Denia Harsyarie is an Information System student at Bina Nusantara University and certified in SAP Fundamental, Financial Accounting and Controlling, and SAP Human Capital Management Module. During her college time, she is awarded as one of Excellence for outstanding Academic Performance Student in 2021 and 2019 and one of scholarship awardees from KEB Hana in 2020 and 2021. In addition to implement her knowledge and get a real experience, she was joined the business competition club in her college and awarded as a country winner for start-up competition from Ideas for Now 2020 and become Indonesia's representative for Hack for Now (international scale). Aside of that, she was awarded as a finalist in start-up competition that supported by Alibaba and Rumah Perubahan 2020, 3rd winner of lection Business case competition 2019 and Top 4 winner of healthcare category in Jakbee Hackathon 2019. Currently, she is a product manager intern at e-commerce company in Indonesia for almost

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Fredy Jingga was born in Pematangsiantar December 17, 1988. Currently held a position as Head of Internationalization and Partnership School of Information Systems, Bina Nusantara University. He was graduated high school at Methodist Christian High School, Pematangsiantar in 2006. Fredy Jingga holds a bachelor's degree in computer science and Master of Management of Information Systems at Bina Nusantara University. Since 2010, he was teaching at the information systems study program at Bina Nusantara University. Fredy Jingga brings to his position a well-established background in Information Systems Analysis and Design, User Experience (UX), scrum, IT Project Management, and has certified SeriousWork Facilitator from LEGO@Serious play®. Fredy Jingga is also active as Subject Matter Expert and facilitator in field of user experience, IT Project Management at BINUS CREATES.