

Research Article

Integration of TAM Model of Consumers' Intention to Adopt Cryptocurrency Platform in Thailand: The Mediating Role of Attitude and Perceived Risk

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The purpose of this paper was to propose a model that examined a study adopting the technology acceptance model with additional constructs (i.e., innovativeness) and the mediating role of attitude and perceived risk to use the cryptocurrency platform in Thailand. The data were collected through a questionnaire-based survey (456 usable responses) from consumers in Thailand. A two-step SEM approach (i.e., a measurement model and a structural model) was used to analyze the data. The findings showed a significant positive influence of perceived usefulness, perceived ease of use, innovativeness, attitude, perceived risk, and cryptocurrency platform adoption. Moreover, attitude mediated the relationship between perceived usefulness, perceived ease of use, innovativeness, and cryptocurrency platform adoption. Overall, our results showed that the model of perceived usefulness, perceived ease of use, and innovativeness explained 62.9% of the variance in the intention to use the cryptocurrency platform in Thailand. Our study has contributed to the technology acceptance model and highlighted its effectiveness in explaining the adoption of the cryptocurrency platform in Thailand.

1. Introduction

Once digital economy has been created, it introduces a new world of business and “technology-related behavior in the global crisis” [1]. Digital money leads to a financial makeover with a variety of brand new perspectives [2]. Cryptographic technology has introduced cryptocurrency to the world. It is known as tokens or virtual money. It can perform various financial functions in the same role as traditional money [3]. Blockchain technology and cryptocurrency tokens have opened the financial world with no boundary [4]. Not only does this virtual money develop the payment process, but it can also change international monetary operations in the time ahead [5]. It is different from traditional money which is collected and controlled within some specific organizations [6]. Blockchain can memorize all business affairs [7]. This virtual money is free from business intermediary [8]. Without mediation, blockchain can stretch an innovation policy for money transactions and data transfer [9].

Cryptocurrency commonly depends on blockchain technology. Normally, there are many activities supporting cryptocurrency [10]. Cryptocurrency has gradually become recognized all over the world. It is a type of digital currency (Lee Kuo [11]). Recently, more than 2,000 cryptocurrencies have been internationally traded. Light [12] estimates the investment in cryptocurrency to be approximately \$700bn. Cryptocurrency is expected to serve all kinds of financial business [13]. It can also be performed with all functions of cash money in business [14]. Unfortunately, most related studies in relation to the intention to adopt cryptocurrency in Thailand are outdated. Even though cryptocurrencies have been studied in the context of global money trade [15], few researchers have attempted to forecast the intention to adopt cryptocurrency in Thailand. For example, Shahzad et al. [16] checked all types of barriers of the bitcoin adoption. Their study focused on bitcoin without touching other virtual currencies. Bitcoin represented only one type of these currencies. Consequently, only few studies can show the complete picture of the cryptocurrency adoption.

The research objectives of the present study are anticipated to reveal two topics. Firstly, the consumers' intention to adopt the cryptocurrency platform will be examined. It is expected to discover the effects of the determinants of the conceptual framework. Secondly, the researchers measure the differences between the TAM framework and the proposed framework. After that, the study outcomes will indicate better factors to develop the foretelling instruments. The study is unique because of these adding constructs.

2. Theoretical Background and Hypothesis Development

2.1. Overview of Technology Acceptance Context. The behavioral intention to use is defined to explain how a user desires to use technology in the future [17]. Most technological research studies have focused on business purposes and attempted to find the effectiveness, efficiency, and usefulness of technology. If a user finds technology helpful, his motivation for using digital technology will increase [18]. Shahzad et al. [16] claimed that the Chinese adopted bitcoin because of the perceived usefulness and perceived ease of use. Many models have been employed to predict behavioral intention. The antecedents and consequences of user perceptions play important roles in technology adoption. Theories have commonly been applied to explore customers' intention to use technology.

2.2. Technology Acceptance Model (TAM). The technology acceptance model (TAM) [19], particularly the final edition of TAM [20], clarifies the user's behavioral intention to use and embrace new technology.

As a result, determining innovative technologies, such as the single platform E-payment System, becomes easier. TAM depicts the association between subjective norm (SN), computer anxiety (CA), and computer self-efficacy (CS) on perceived ease of use (PEOU). The perceived usefulness (PU), perceived ease of use (PEOU), and subjective norm (SN) all have an impact on behavioral intention to use (BI), which leads to utilization behavior (UB). According to the new TAM relationships, the experience will impact the relationship as follows.

Consumers choose a service based on its perceived usefulness, or on whether they believe it will improve the use of technology [21]. In banking studies, many researchers have discovered a strong correlation between perceived ease of use and attitudes toward new technology adoption [22, 23]. In the last ten years, empirical studies have demonstrated that perceived usefulness has a favorable impact on customers' propensity to purchase [24]. According to Riquelme and Rios [25], perceived usefulness has a significant impact on consumers' attitudes and willingness to accept technology. Users are more likely to adopt technology services if they are perceived as convenient, enjoyable, and easy to use [25].

PEOU and intention to use technology services such as mobile payment services have a substantial positive link [26–28]. PEOU is noteworthy in terms of the predicted value of mobile financial service adoption [29]. We believe that the

PEOU of mobile payments will positively influence Gen X's behavioral intents to use the cryptocurrency platform, based on the literature. During the COVID-19 epidemic, they will find it useful and beneficial. As a result, we propose the following:

Hypothesis 1. PU has a direct effect on the consumers' attitude toward the intention to adopt the cryptocurrency platform.

Hypothesis 2. PU has a direct effect on the consumers' perceived risk toward the intention to adopt the cryptocurrency platform.

Hypothesis 3. PEOU has a direct effect on the consumers' attitude toward the intention to adopt the cryptocurrency platform.

Hypothesis 4. PEOU has a direct effect on the consumers' perceived risk toward the intention to adopt the cryptocurrency platform.

2.3. Innovativeness. According to Rogers [30], innovativeness is concerned with people's biased predisposition to adopt new ideas. Because of their preferences in innovation, consumers usually react differently to innovative products and services or ideas. A number of studies have found that consumers' inherent innovativeness (II) has a significant beneficial impact on the adoption of new products and services [31]. II has either direct or indirect influence on innovation adoption usually relying on individual personality. These discoveries were also mentioned by Handa and Gupta [32]. Much evidence indicates that II has a beneficial force on consumers' perception with regard to innovation. Early adopters, especially, are likely known as innovative consumers. This group of people typically has a higher level of education. Therefore, they can develop their skills to overcome the disadvantages of new technology [33]. Eventually, they enjoy the advantages of the innovation. Historically, innovative users are more interested in innovations before other type of users. They have an uncommon talent to cope with risk [30]. Thakur and Srivastava [34] examined the direct and negative reaction of consumer innovativeness on perceived risk in electronic business adoption such as e-banking and e-retailing. Based on this discussion, the subsequent hypotheses are suggested as follows:

Hypothesis 5. INNO has a direct effect on consumers' attitude toward the intention to adopt the cryptocurrency platform.

Hypothesis 6. INNO has a direct effect on consumers' perceived risk toward the intention to adopt the cryptocurrency platform.

2.4. Attitude. Attitude towards behavior involves the area where an individual certainly or uncertainly pays attention to something. Attitude can be seen through a visible display of individual actions [35]. Although attitude can change over time and context [36], its role in the theory of planned

behavior (TPB) is stable [37]. Defenders of the TPB state that it provides better tools to foretell users' attitudes [38]. Consequently, the TPB is suitable for an innovative study. Even though many opponents protest against the TPB framework [37, 39], it is consistently used as a compulsory model to study users' acceptance of new technologies [40–43]. According to this argument, the next hypothesis is presented as follows:

Hypothesis 7. Consumers' attitude has a direct effect on their intention to adopt the cryptocurrency platform.

2.5. Perceived Risk. Several research studies have claimed that a user's intention to use technology is influenced by perceived risks (PR) [44]. Many studies have found that "privacy and security" entail high anxiety levels and play a key role in customers' willingness to utilize mobile payments [26, 45–47]. Recently, the use of cash, banknotes, and contact payment transactions have been found to be main transmission sources for the COVID-19 virus in humans. World Health Organization (WHO) recommends people to avoid using cash. They encourage everyone to apply contactless payment and use virtual currency in their financial affairs [48]. Perceived risk has been found to be one of the three most important elements in influencing cryptocurrency acceptance [49] because it is recognized as a crucial element for behavior change. Many studies have mentioned that banks should guarantee the security of their accounts, as this is an essential antecedent to electronic/online banking [50]. In rural locations particularly, perceived risk shows a remarkable influence on mobile banking [51]. In accordance with the above discussion, the ensuing hypothesis is stated as follows:

Hypothesis 8. Perceived risk has a direct effect on customers' intention to adopt the cryptocurrency platform.

According to experimental studies, there is no evidence of the mediating effects of perceived risk and trust on UTAUT and behavioral intentions to adopt the cryptocurrency platform. As a result, the indirect effects of UTAUT and behavioral intention to cryptocurrency acceptance with perceived risk and trust as mediating factors (Hypotheses 9–14) are assessed in this literature. Thus, the following hypotheses are suggested:

Hypothesis 9. PU has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.

Hypothesis 10. PU has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.

Hypothesis 11. PEOU has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.

Hypothesis 12. PEOU has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.

Hypothesis 13. INNO has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.

Hypothesis 14. INNO has an indirect effect on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.

3. Methodology

3.1. Development of Hypotheses and Proposed Framework. The proposed framework helps to illustrate many determinants associated with consumers' behavioral intention toward cryptocurrency adoption. Attitude and perceived risk are viewed as strong mediator variables of cryptocurrency platform adoption [52]. Recent studies have indicated independent variables (IVs), which are connected to the technology acceptance model in the adoption, innovativeness, and perceived risk theories. Research studies have requested many variables including perceived usefulness (PU) [53] and perceived ease of use (PEOU) from TAM. The constructs in TAM are a common subgroup of the perceived characteristics of the innovation. The statistical synthesis of the results from a series of studies analyzed by Daragmeh et al. [54] has been presented to be persistently linked to innovation adoption: compatibility, complexity, and relative advantage [54, 55]. Even though Wang et al. [56] indicated logically dissimilar factors, they evaluated the same variables (as shown in Figure 1).

Quantitative survey research methods were used in this study [57, 58]. Research measurement scales are widely used and commonly accepted in the literature on technology acceptance. At the beginning of the questionnaire, respondents were asked about their basic knowledge of cryptocurrency. At the end of the questionnaire, respondents were asked about their personal data.

3.2. Population, Sampling, and Data Collection. Since the population was large and the researchers did not have the data about the total number of the population, the sample size used in this study was calculated using the formula developed by Cochran [59]. Thus, the minimum sample size for this study was 385. The study used the three-stage probability sampling technique and quotas for age and gender to guarantee that the proportion of each separate group of individuals (by gender, income, age, and occupation) was based on the official Thailand statistics.

The survey questionnaire focused on the cryptocurrency behavior and included questions on the use of cryptocurrency platforms. There were three fundamental requirements for the research respondents: the respondents must be Thai citizens who have the cryptocurrency platform in Thai; all respondents were required to have appropriate experience with mobile and web-based applications; and they must also have at least three months of experience using

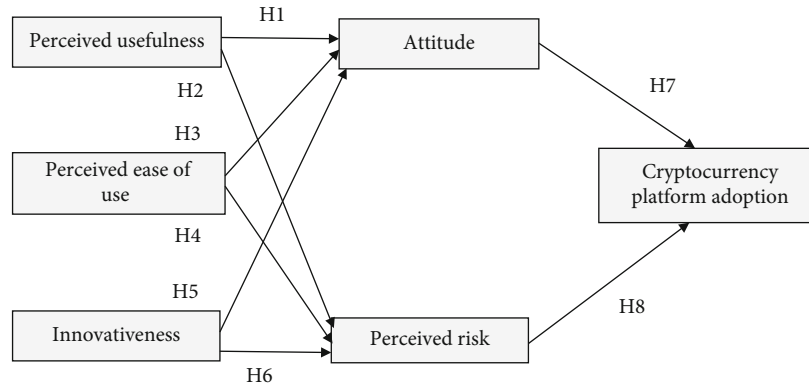


FIGURE 1: Research model.

a smartphone and the cryptocurrency platform [60]. A snowball sampling technique was applied in which respondents were continuously selected through friends or acquaintances. Online questionnaires were sent to the respondents via e-mail and social networks [61]. The first respondent was chosen from a simple random sampling technique. These respondents recommended other respondents or distributed online questionnaires to people who had experience in cryptocurrency platform services. To this end, the online questionnaires were provided to respondents categorized by gender, age, education, occupations, and incomes in order to cover all the cryptocurrency platform services of each organization. Finally, the sample size of this study was sufficient to meet the aims of the study.

3.3. Variable Measurement. A research questionnaire was created to cumulate the data. The measurement statements were grouped to develop the questionnaire:

- (i) Four items on perceived usefulness, perceived ease of use, innovativeness, and attitudes were adapted from Davis [19]
- (ii) The scale for perceived risk, which included 6 variables and 23 items, was adapted from Martins et al. [55] and Namahoot and Laohavichien [63]
- (iii) Three items of behavioral intention to use were adapted from Nasri and Charfeddine [64] and Namahoot and Laohavichien [63]

All of the statements in the questionnaire were rated on a 5-point Likert scale, with 1 indicating “strongly disagree” and 5 indicating “strongly agree.” The respondents were asked to mark these scales in response to each of the assertions.

3.4. Validation of Measurements. The researchers had two steps to assess the questionnaire validity. In the step of the data collection, the researchers sent the questionnaire to professionals for a pilot test. A first draft of the questionnaire was distributed to a panel of experts for feedback [65]. They were expected to identify any mistaken statement. Saunders et al. [65] claimed that the first rough sketch of the question-

naire should be handed to a panel of experts for analysis. The qualified counsellors would double check every single detail in the statements [66]. The submission time was mentioned in the questionnaire. To evaluate the survey tool in the context of Thailand, questionnaires were addressed to professionals in bank information technology departments, as well as researchers from numerous Thai institutes. A pre-test was then performed in order to correct the instrument. Respondents were requested to provide feedback on the instrument’s structure, wording, format, length, and language [67]. As a result, the instrument’s content validity was validated. The responses from these 30 users were evaluated using IBM SPSS version 20 to ensure that the measurements were accurate. The Cronbach’s alpha values must be much greater than the minimum recommended value of 0.7. As a result, all elements had adequate values to reach the level of instrument reliability [66].

4. Data Analysis

The information was evaluated in two ways. The SPSS for the Windows software was used to evaluate descriptive statistics. To check one-dimensionality, frequency and descriptive statistics such as average, percentage, variance, and distribution normality testing were used. To test the hypotheses, confirmatory factor analysis (CFA), convergent validity (AVE), discriminant validity, and structural equation modeling (SEM) were used. SEM is a confirmatory method that can be used to investigate and modify theoretical models in depth [68]. The presented hypotheses were tested using SEM inferential statistics with a significance level of 0.05.

5. Results

5.1. Descriptive Statistics. The demographic profile of the 456 respondents was calculated using frequency and percentage. According to this study, most cryptocurrency platform users were male (55.30%), aged between 26 and 30 years (41.00%), with an undergraduate degree (63.40%), worked as employees (39.50%), and received monthly incomes higher than 30,000 Baht (25.0%).

5.2. Assessment of Univariate Normality. This is how the measuring model's three-stage technique could be explained. In the first stage, all model components had to have skewness values of less than 2 (+2.0) and kurtosis values of less than 7 (+7.0) to meet the normalcy assumption [69]. Following that, Cronbach's alpha was used to determine the scales' internal consistency as well as the constructions' dependability. Cronbach's alpha values must all be more than 0.70, which was the previous standard approval value [66]. Following the reliability test, 51 items in the questionnaire were examined. Consequently, Cronbach's alpha values were found as follows: 0.730 (innovativeness), 0.829 (perceived usefulness), 0.798 (perceived ease of use), 0.818 (attitude), 0.834 (perceived risk), and 0.746 (BI). Anyhow, some items had less than 0.7. Therefore, items PS1 and PS3 of social risk were terminated from the research model. The final results of Cronbach's alpha tests are shown in Table 1.

Standardized regression weight was conducted to scan all items for the reliability. The standardized regression weight values in a measurement model were originally checked. Items with standardized factor loadings lower than 0.6 were pulled out [66]. In accordance with this research, the loading values of three items were found to be less than 0.60. Therefore, items PE1, PE2, and PE4 were deleted at this stage. Additionally, composite reliability (CR) and AVE were examined using completely standardized solutions in the CFA results [70].

5.3. Convergent Validity. To check the convergent validity in this research, these ensuing values and conditions were applied: factor loadings, composite reliability (CR), and AVE [71]. (1) Standardized factor loadings indicate the degree of association between scale items and a single latent variable. The level of factor loadings must be above the level of 0.6 [72]; (2) CR is investigated to show the degree that all items are free from random error. A consequence result presents unchanging results. The CR values must be higher than 0.7 [66]; (3) AVE is detected for the variation by checking the latent variable for the random measurement error. The suggested level of AVE must be higher than 0.5 [71]. Therefore, the convergent validity is approved (Table 2).

5.4. Discriminant Validity. Normally, there are a number of ways to assess the discriminant validity between constructs. According to the study, the discriminant validity of the constructs was examined using the square root of AVE. Then, it was weighed up with the relationship between the variables and all other variables [71]. The outcomes of standardized loadings and validity presented that the square root of the AVE values indicated the recommended correlation values, exhibiting acceptable discriminant validity (Table 2).

5.5. Assessment of the Measurement Model. Confirmatory factor analysis (CFA) was analyzed in the second step, with a total of 44 items. The goodness of fit of the SEM was considered by how closely it represented the observed covariance matrix among the key indicators. The model fit was evaluated by viewing a group of indicators. They could be categorized into four groups [66]: (1) examination of chi-

square including degree of freedom (df) and probability; (2) examination of absolute fit including goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), and root mean square residual (RMR); (3) examination of incremental fit including the normed fit index (NFI) and the comparative fit index (CFI); and (4) examination of parsimony fit including the adjusted goodness-of-fit index (AGFI) and the parsimony normed fit index (PNFI). Iacobucci [73] claimed that among the SEM fit indicators, the chi-square (χ^2) revealed the only inferential statistic, while all the others were descriptive statistics. Consequently, chi-square (χ^2) offered great hypothesis testing while others only showed "rules-of-thumb" to estimate goodness of fit. The measurement model met the data satisfactorily ($\chi^2 = 1279.78$, $df = 475$, p value > 0.05 , $RMSEA = 0.060$, $RMR = 0.025$, $CFI = 0.910$, $IFI = 0.911$, $TLI = 0.900$, $AGFI = 0.810$, and $PNFI = 0.710$).

5.6. Structural Equation Model and Hypothesis Testing. At the last stage, the squared multiple correlation (R^2) value for the relationship between the three variables and behavioral intentions to use cryptocurrency was revealed to be 0.455, which exhibited a 45.50 percent variance in behavioral intentions to use by the amalgamation of all hypotheses Hypothesis 1 ($\beta = 0.476$, $p \leq 0.000$), Hypothesis 2 ($\beta = 0.724$, $p \leq 0.000$), Hypothesis 3 ($\beta = 0.413$, $p \leq 0.000$), Hypothesis 4 ($\beta = 0.292$, $p \leq 0.00$), Hypothesis 5 ($\beta = 0.300$, $p \leq 0.00$), Hypothesis 6 ($\beta = 0.111$, $p \leq 0.00$), Hypothesis 7 ($\beta = 0.956$, $p \leq 0.00$), and Hypothesis 8 ($\beta = 0.040$, $p \leq 0.474$). The summary of all the findings showed that some hypotheses were supported. However, Hypothesis 8 was rejected, which meant that perceived risk playing a major role in their intention to adopt the cryptocurrency platform (Table 3 and Figure 2).

Moreover, the indirect effects, Hypotheses 9–14, were connected with equally strong unique latent variables. A bootstrapped sampling distribution of the difference in ω s estimates ($\Delta\omega$ s) was estimated via 2000 parametric bootstrapped replications. In Amos 21 [74], such a test could be worked by generating a user-defined estimate. The results supported Hypotheses 9–14. It could be explained that perceived risk and attitude acted as mediators of perceived usefulness, perceived ease of use, innovativeness, and cryptocurrency platform adoption.

The remarkable discovery of cryptocurrency adoption revealed the greatest impact on perceived risk and attitude. The variance on the construct was exhibited to be at 62.30% and 48.70%. Correspondingly, there were prominent links among perceived usefulness, perceived ease of use, innovativeness perceived risk, and attitude on cryptocurrency platform adoption. They were shown to be at approximately 95.30% of the variance (as shown in Figure 3).

6. Discussion and Conclusion

This research paper emphasizes great impacts of attitude and perceived risk acting as mediators. They play important role in the integration of the TAM model and innovativeness. The research findings illustrate that the TAM model and innovativeness can create positive attitude and turn

TABLE 1: Reliability and discriminant validity assessment.

Construct	Observed variable	Cronbach's alpha (α)
Innovativeness	INN1, INN2, INN3, INN4	0.730
Perceived usefulness	PU1, PU2, PU3, PU4	0.829
Perceived ease of use	PEOU1, PEO2, PEO3, PEO4	0.798
Attitude	ATT1, ATT2, ATT3, ATT4	0.818
Perceived risk	Financial risk (PF5, PF6, PF7, PF8)	0.834
	Psychological risk (PY9, PY10, PY11, PY12)	0.814
	Performance risk (PP13, PP14, PP15, PP16)	0.848
	Privacy risk (PR17, PR18, PR19, PR20)	0.867
	Time risk (TR21, TR22, TR23)	0.883
Behavioral intention to use	BI1, BI2, and BI3	0.746

TABLE 2: Results of standardized loadings and discriminant validity.

Model and construct	Range of standardized loadings	CR	AVE	Discriminant validity						
				1	2	3	4	5	6	
Perceived usefulness	0.68–0.77	0.830	0.550	0.742						
Innovativeness	0.71–0.77	0.717	0.561	0.694	0.749					
Perceived ease of use	0.75–0.77	0.804	0.578	0.500	0.340	0.760				
Attitude	0.66–0.70	0.819	0.530	0.644	0.579	0.595	0.728			
Perceived risk	0.69–0.80	0.972	0.876	0.787	0.512	0.540	0.732	0.936		
Behavioral intentions to use	0.67–0.70	0.700	0.529	0.665	0.583	0.536	0.987	0.699	0.728	

down perceived risk for consumers' intention to adopt the cryptocurrency platform in Thailand.

In the order of importance, these determinants are, respectively, ranked: perceived usefulness, perceive ease of use, and innovativeness. Perceived usefulness is the most crucial element for cryptocurrency adoption, with the highest significance of factor loading at 0.476 (as shown in Figure 2). Therefore, a team ought to create a friendly environment. A network should be arranged to keep in touch with all traders who are interested in cryptocurrency. Consequently, customers are regularly informed and can achieve better financial efficiency. For instance, as increasing returns generate financial benefits, traders pay more attention to financial news [54].

However, the outcomes of the research emphasized technical teams [16]. Technical knowledge of customers usually depends on the support team. Therefore, users will be attracted to the cryptocurrency platform if it is not complicated. Money transfer, particularly, can present its advanced security system and its beneficial services. They commonly weigh up these benefits and difficulties [75]. Recently, more than 2.1 million applications are available for Android users, followed comparatively by Apple with more than 2 million applications [76]. Consumers have to develop their skill dealing with different interfaces. The current research findings demonstrate that perceived ease of use is equivalent to user-friendly design. Easy-to-use system allows users to accessibly and rapidly adopt service innovation. These results go along with the study of Rogers [77] and also with many other studies [78]. They reveal that perceived ease of

use is not an important element to perceived usefulness and actual use of the cryptocurrency platform. It is implied that the more customers are able to adapt to the system, the more they feel confident and open up for the advantages of virtual transactions.

Innovativeness is recognized as a great component with the factor loading of 0.476. It was also found in the study of Tarhini et al. [79]. This study especially combines both forms of consumer innovativeness and TAM. The combination presents special details about the predictive power for the intention to adopt the cryptocurrency platform. Moreover, the adding variables in a TAM framework have improved the forecasting ability of the academic framework. It shows a better interpretation about consumer innovativeness and its influence. This issue has been discussed in various case studies [31]. The results reveal another perspective of consumer innovativeness. Innovativeness has come up as the greatest forecaster of the intention to adopt electronic banking. This consequence confirms the research results studied by Lassar et al. [80]. Innovativeness has an important impact on attitude and perceived risk. Innovative products usually improve new features for greater use. It is assumed that the adoption trend may rise when innovative products are easy to use. A foolproof system should be applied for all walks of life. Eventually, new services will become favorable options.

These things make customers aware of the risks. Service providers should realize the importance of privacy risk and try their best to work under these circumstances. Transaction logging discloses personal information. Cryptocurrency

TABLE 3: Summary of the effects and research hypothesis testing.

Hypothesis	Result	Standardized estimate
H1: PU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform.	Supported	0.476***
H2: PU has influences on consumers' perceived risk toward the intention to adopt the cryptocurrency platform.	Supported	0.724***
H3: PEOU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform.	Supported	0.413***
H4: PEOU has influences on consumers' perceived risk toward the intention to adopt the cryptocurrency platform.	Supported	0.292***
H5: INNO has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform.	Supported	0.300***
H6: INNO has influences on consumers' perceived risk toward the intention to adopt the cryptocurrency platform.	Supported	0.111***
H7: consumers' attitude has influences on their intention to adopt the cryptocurrency platform.	Supported	0.956***
H8: perceived risk has influences on consumers' intention to adopt the cryptocurrency platform.	Not supported	0.040
H9: PU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.	Supported	0.392***
H10: PU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.	Not supported	0.025
H11: PEOU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.	Supported	0.267***
H12: PEOU has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.	Not supported	0.008
H13: INNO has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by attitude.	Supported	0.239***
H14: INNO has influences on consumers' attitude toward the intention to adopt the cryptocurrency platform mediated by perceived risk.	Not supported	0.004

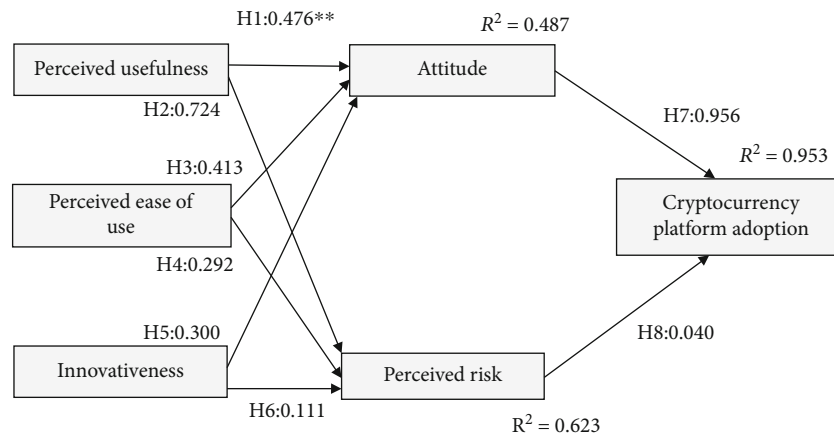


FIGURE 2: Final analysis of the structural equation model.

services can cause the theft of the personal data. Using cryptocurrency technologies make it easy to track. Subscription and access to cryptocurrency services have no security. System malfunction makes the payment process invalid. Security system in cryptography fails to prevent hackers from breaching the account. Using the cryptocurrency platform

is time-consuming. Bugs in the cryptocurrency platform take too much time to fix. Learning how to use the cryptocurrency platform is such a waste of time. Using the cryptocurrency platform causes anxiety. Using the cryptocurrency platform makes life more difficult. Cryptocurrency services bring about sleeping problems. There are more cases of

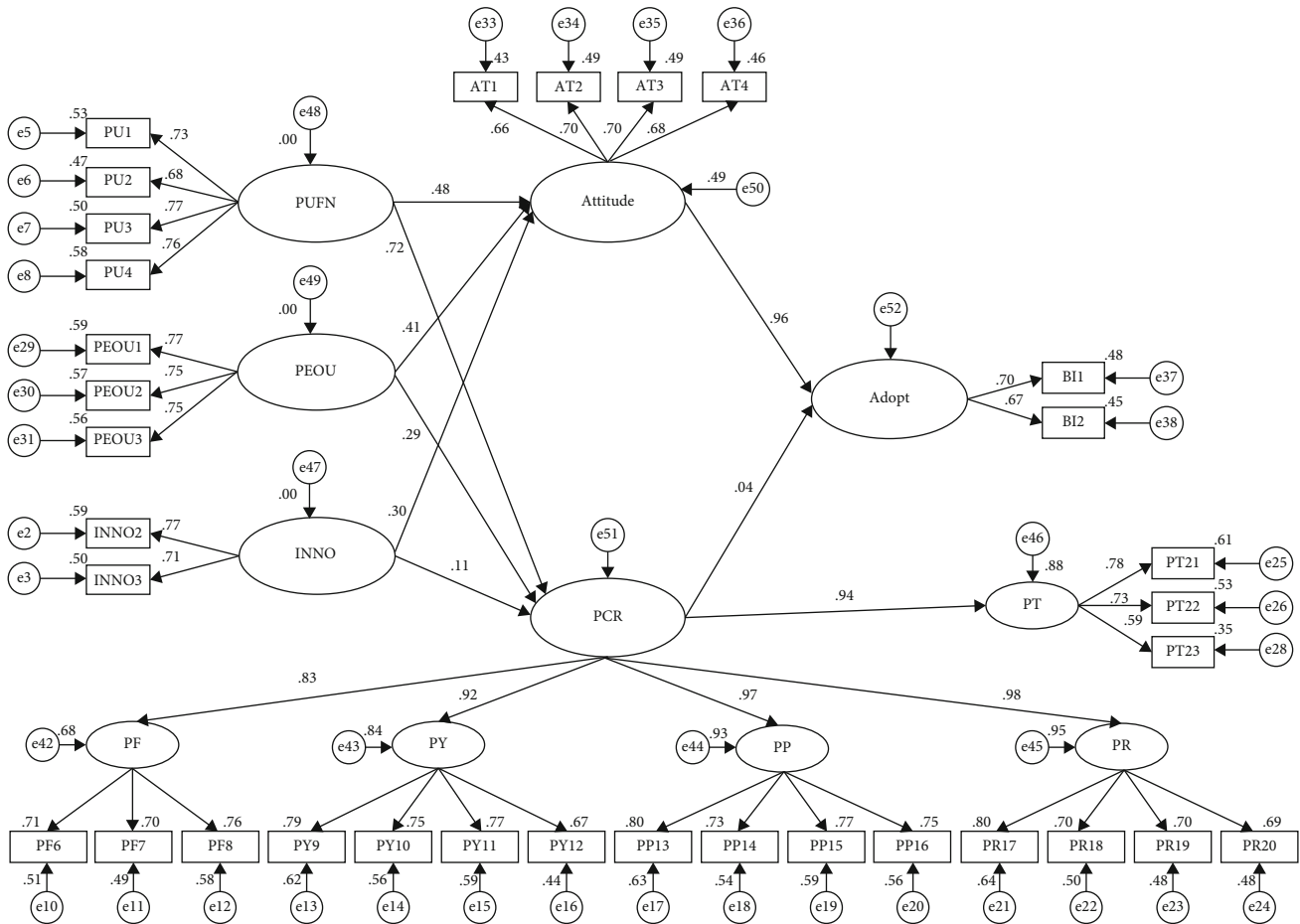


FIGURE 3: Results of the analysis of the structural equation model.

money cheating in the cryptocurrency platform. Access to the cryptocurrency platform has the possibility of losing money in the bank account. If the cryptocurrency system is wrong, it causes loss of money without refunding.

Attitude is one of the important elements in relation to the adoption of the cryptocurrency platform. In fact, it also presents a powerful, beneficial, and direct influence on the adoption to use. In some contexts, an individual’s feelings or attitudes also influence his/her predisposition to use a new technology. If consumers have insufficient information to make a real judgment on future use of innovative products, the effect on the attitude towards the use may not be strong. Even though they have little information, the consumers’ attitude has a final impact on the intention to use a new cryptocurrency platform.

6.1. The Role of Perceived Risk and Trust as Mediating Variables. This study presents the powerful mediating influence of the attitude toward the cryptocurrency adoption in Thailand. Attitude is shown as the strongest impact in this research model while other factors, namely, perceived usefulness, perceived ease of use, and innovativeness, have indirect influence on adoption. It can be understood that when users have positive attitude in using cryptocurrency platforms, they are likely to agree to adopt them.

Service providers should create a favorable attitude in the consumers. They must thoughtfully improve strong networks that emphasize the adoption of the cryptocurrency platforms. The system must combine three important aspects of services: a pleasant service, a good concept, and beneficial services. For example, financial institutions should design a user-friendly system. Moreover, they need to develop a help desk to provide information or give recommendations for better decisions. Therefore, clients can enjoy advantages of their services. Banks should open more channels for their customers to access financial news. They should also provide users with 24-hour technical support in case users face difficulties while using the system. Consequently, clients will have a sense of security.

Although many determinants of perceived risks have not been viewed as major indicators of the adoption of the cryptocurrency platform, they have the possibility to increase the degree of cryptocurrency platform use. Normally, users are interested in five aspects of risks: privacy risk, performance risk, time risk, psychological risk, and financial risk. It is compulsory that providers create a strong and dependable network that does not break down during transactions. These attempts can help strengthen service capabilities. In the first place, users must have a positive perception that the use of the cryptocurrency platform is much easier than

other traditional money transactions. In the second place, among many different types of users, service providers should pay attention to innovative customers. These people have some technological skills so they find it easy to perceive the use of the cryptocurrency platform. These findings go well with the previous finding of this research related to the perceived ease of use. Prior findings have indicated that perceived ease of use is not a major element towards perceived usefulness and actual use of the cryptocurrency platform, particularly for commercial users. These current findings present that if the cryptocurrency platform can provide more compatibility with existing values and practices, the commercial users will have more confidence and consider the cryptocurrency platform useful for commercial transactions.

7. Conclusion

This research study has attempted to monitor the combination of the TAM model and add factors in the examination of cryptocurrency platform adoption. According to the outcomes, TAM model with innovativeness shows a strong impact on attitude and perceived risk. There is an indirect influence towards cryptocurrency adoption when attitude plays a role as mediator at the 0.001 level of significance. In the final analysis, the research findings indicate that TAM model, innovativeness, and attitude are crucial elements for cryptocurrency adoption in Thailand.

8. Implications and Limitations

8.1. Implications for Theory. Researchers may benefit from these findings when exploring innovation marketing strategies through platforms, including cryptocurrency. In addition, this research contributes to developing an understanding of how humans react to emerging technologies [81].

This research shows a dominant overview of the cryptocurrency adoption and its influence on consumer behavior in Thailand. The proposed model is modified from the concept of TAM. This proposed model also adds innovativeness to provide the basic logical sequence for attitude and perceived risk. According to this study, the TAM model and innovativeness are used to illustrate the role of behavioral intention to adopt cryptocurrency. The research outcomes show that the proposed model has a strong explanatory power of 95 percent to foretell individual behavioral intention to adopt cryptocurrency. Outstanding remarks of the study are discussed. In line with Ajzen [17], attitude is viewed to be the greatest factor influencing behavioral intention, followed by perceived behavioral control. The research results also show that attitude as a construct of the TAM model and innovativeness have the greatest significant influence ($\beta = 0.74$) on behavioral intention to adopt cryptocurrency. This may indicate that once respondents have a higher positive attitude towards cryptocurrency, behavioral intention to adopt cryptocurrency also increases to 74 percent.

8.2. Implications for Practice. On the report of the research findings, the following results can be presented to financial institutions to provide suggestions on cryptocurrency adoption. Research related to human behaviors and emerging technologies has progressed and been examined from various perspectives [1]. Perceived usefulness is the most important factor that respondents consider when they think about adopting the cryptocurrency platform. It also presents a significant impact on cryptocurrency adoption.

Perceived usefulness and perceived ease of use should be more emphasized with regard to countless amounts of service offerings and usability. Because of this, an advertising agency should focus its attention on a variety of money solutions that are served to cryptocurrency traders. A thoughtful customer experience management strategy is necessary. Support teams have to constantly develop the working system to be easiest to use. Not only does usability have a direct impact on behavioral intention to adopt cryptocurrency, but it also has powerful influence on perceived system usefulness. These research results obviously recommend that the more people find cryptocurrency platform user-friendly, the more they find it useful.

Consumer innovativeness becomes a major part of cryptocurrency adoption. These characteristics are discovered only among innovators and early adopters. Service providers must know how to differentiate between innovative consumers and general consumers. Then, service offerings are presented to these innovators. Another thing that is found in this research is that innovativeness can greatly increase the attitude perception. After that, people are likely to adopt the cryptocurrency platform. These outcomes would benefit entrepreneurs, especially chief executive officers who will be able to develop service innovation according to the consumers' needs. This can be accomplished by increasing consumers' desire to look for information by giving an information search facility on the cryptocurrency platform, as product information search is positively associated with innovativeness [82]. For this reason, banks may place a premium on providing links on their websites that facilitate financial product comparison as well as links to other information sources such as expert reviews, consumer reviews, news, and information about the banks' various security features, which may encourage Internet users to become more domain-specific innovative. As a result, their perceived risk of utilizing bitcoin platforms decreases, and adoption grows. In addition, this study explains that cryptocurrency is a technology that has the ability to influence human decision-making [83].

8.3. Research Limitations and Guideline for Research Directions. Further studies should express more concerns about nonusers or passive cryptocurrency platform users, particularly sophisticated comparisons of demographic dissimilarity among users. Besides, future studies should be able to associate any determinants that might have a significant influence on nonusers of the cryptocurrency platform.

Even though the study presents theoretical and practical implications in certain dimensions affecting cryptocurrency adoption, this current study also revealed several limitations.

First of all, a convenient sampling was applied. This sampling is one type of nonprobability sampling. All members of the population have an equal chance of participating in the study. However, this method is not usually used to in studies related to the adoption of innovative technology. Therefore, it will be better if researchers employ probability sampling. In addition, all respondents in the present study were Thais, so the questionnaire was produced for only Thai users. From this point forward, research data should be accumulated from respondents who come from many different areas and speak different languages. Multilingual surveys should be available. Furthermore, the majority of the respondents had excellent computer and Internet literacy. The research results might reveal narrow perspectives. Consequently, future studies should provide a broader point of view, if respondents are selected from different demographic characteristics. Thirdly, this study was restricted to quantitative data. An in-depth investigation was not analyzed in this study because of the limitations on the time and resources. A mixed method using both qualitative and quantitative approaches should be prepared in future research studies. This method can reveal new discoveries, and the results will provide a deeper understanding on this topic. Finally, a self-reported assessment was used to check customer manners. Hereafter, examinations should be more concentrated on collecting and examining data of real usage.

Data Availability

The original contributions presented in the study are included in the article; further inquiries can be directed to the author: Kanokkarnn@nu.ac.th.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

K.N. conceptualized and participated in research design, performed the research methodology, coordinated and supervised the data collection, and conducted the analysis assessment of univariate normality, convergent and discriminant validity, measurement model, structure model, and hypothesis testing. V.R. coordinated the data collection, carried out the conclusion and discussion, read and proofread, and edited the manuscript. Both authors read and approved the manuscript as submitted and agreed to be accountable for all aspects of the work.

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