International Journal of Economics, Management, Business and Social Science (IJEMBIS)
Peer-Reviewed – International Journal
Volume 2, Issue 3, September 2022
E-ISSN: 2774-5336
https://cvodis.com/ijembis/index.php/ijembis

Developing The Diffusion Innovation in Transaction Adoption Based on Blockchain Networks: SEM – Neural Network Empirical Study

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Received: August 1, 2022
Accepted: August 30, 2022
Published: September 30, 2022

Citation: Ramandhan, A., Hanifah., & Hayati, C. (2022). Developing The Diffusion Innovation in Transaction Adoption Based on Blockchain Networks: SEM – Neural Network Empirical Study. INTERNATIONAL JOURNAL OF ECONOMICS, MANAGEMENT, BUSINESS AND SOCIAL SCIENCE (IJEMBIS), 2(3), 485–498. https://cvodis.com/ijembis/index.php/ijembis/article/view/87

Abstract.
This research is aimed to examine the effect and relative importance of diffusion of innovation characteristics, perceived cost, and financial literacy in using blockchain network transactions. This research collected 100 data from a questionnaire of blockchain network users and analyzed using SEM–PLS and Neural Network. SEM–PLS in this research aims to analyze an independent variable's effect on a dependent variable. At the same time, the neural network is used to measure the relative importance of each independent variable on a dependent variable. The result of this research in SEM–PLS shows that compatibility, relative advantage, and perceived cost have a significant effect. In contrast, complexity and financial literacy do not significantly affect the intention to use a blockchain network. Furthermore, the result of the neural network shows that relative advantage is the most important variable in affecting the intention to use of blockchain network, followed by perceived cost and compatibility

Keywords: *Blockchain Network; SEM–Neural Network; Diffusion of Innovation; Perceived Cost; Financial Literacy]*

1. Introduction

The blockchain network is of technological development today that allows users to transact without the supervision of third parties or intermediaries and transactions are anonymous with guaranteed user data security. It caused many advantages in transactions using the blockchain network because it is safer and more secure than transactions in general through banking. The forms of service utilization in the blockchain network are also very diverse, ranging from smart contracts and financial transactions to data integration (Korpela et al., 2017; Sultana et al., 2020). Many companies are finally innovating to develop blockchain networks, such as Bitcoin, BNB Smart Chain (BEP20), Ethereum (ERC20), Tron (TRX20), and

many others. With this innovation competition, every developer of blockchain network services continuously improves the quality of the services provided.

The popularity of blockchain technology has led many open-source technology infrastructure developers to integrate payment services using blockchain networks for e-commerce. The blockchain network also has a framework that can make it easier for developers to integrate and implement it, provide interbank connections, digital asset payments, and make global payments more cost-effective and faster (Taherdoost, 2022). However, different types of blockchain networks have different efficiencies and transaction costs (Banerjee, 2019). In addition, the blockchain network is also based on the adjustment of user needs. This makes it a competition with digital banking transaction services commonly used by the public or end users today. Therefore, it is very important to analyze further the factors that can increase users' convenience in transacting using the blockchain network.

A blockchain network is a form of technological innovation that is implemented to lead to the innovation of digitizing society. This is in line with the theory forward by Everett Rogers, how innovation in the form of an idea or technology can be implemented and adopted by the wider social system of society called the diffusion theory of innovation (Rogers, 2003). The theory states that the things that people consider in adopting technology are complexity, compatibility, relative advantage, observability, and trialability. Therefore, the measurement of transaction adoption using the blockchain network needs to pay attention to these aspects so that the social community can accept it. Today, blockchain networks need to be considered from a financial perspective. It's caused of the products attached to the blockchain network technology are related to digital finance and cryptocurrencies, which generally require fees to conduct transactions.

In contrast, in implementing technology, withdrawal fees are charged by the end user (Pham et al., 2022). Furthermore, transactions using the blockchain network are advanced innovations in banking services. However, the transaction does not indicate a name to maintain the user's anonymity. Because of that, it is expected that users of blockchain network transactions have a basic understanding of financial literacy (Arias-Oliva et al., 2019).

Technological innovation is a form of progress inherent in a civilized society to facilitate human operational activities, including blockchain networks. Innovation is formed by certain characteristics that trigger the occurrence of an idea and novelty to be accepted by the community (Rogers, 1995). Everett Rogers finally outlined these characteristics through the diffusion of innovations theory in 1964, which consisted of complexity, compatibility, relative advantage, observability, and experimentation. However, the development of research related to innovation shows that the variables of trialability and observability are not consistently confirmed to be relevant in the topic of broad individual technology adoption (Koenig-Lewis et al., 2010; Plewa et al., 2012). This is because trialability and observability are part of the early planning and analysis stages before the technology is released. So it can be said that the theory can be relevant to the steps to measure the adoption of technology.

With the characteristics of the diffusion of innovation in an acceptance of technology, the adoption of technological innovations such as blockchain networks for transactions can be measured in terms of improvising the functionality of the technology itself. The blockchain network originated from the discovery of Bitcoin as a cryptocurrency created using blockchain

technology by Satoshi Nakamoto, which was formed from cryptography in 2009 in anticipation of public unrest related to the economic recession at that time (Nakamoto, 2008). Then many blockchain networks were developed and widely circulated - other blockchains used by the community, such as BNB Smart Chain (BEP20), Ethereum (ERC20), Tron (TRX20), and others that have innovations and advantages that rival the first blockchain network, namely bitcoin. The innovation product of blockchain network technology itself is a form of innovation and development of digital banking services that exist today. However, the form of innovation and distinction of the blockchain network guarantee the security of anonymity and can easily and cheaply transact internationally (Golosova & Romanovs, 2018).

In addition to the form or product of technological innovation, the blockchain network is also a representation of the form of financial technology development that is popular today. This is evidenced by the number of financial transactions using the blockchain network for Bitcoin, Ethereum, and Litecoin, more than 1 million transactions daily (Glassnode, 2022). Financial technology products such as blockchain networks are advanced digital banking forms that require financial literacy (Fujiki, 2020). The representation related to financial literacy on the use of blockchain networks is to pay attention to the security of transactions and the effectiveness of use by users. In addition, the blockchain network is also embedded with digital assets such as cryptocurrencies that are used as transaction objects and can be a form of investment that requires financial literacy. Furthermore, using blockchain network technology also has costs that need to be borne by users in a transaction. So it is very important to integrate the financial aspect into the innovation of blockchain network technology.

Based on the background problems above, this study aims to analyze and measure the level of importance and influence of the characteristics of the diffusion of innovation, cost, and financial literacy on transaction interest in using the blockchain network. Therefore, this study implemented the method of Structural Equation Modeling - Partial Least Square (SEM - PLS) and Neural Network, where SEM - PLS aimed to analyze the effect of the independent variable on the dependent. In contrast, the neural network aimed to measure the importance of each independent variable on the dependent variable. By conducting this research, it's hoped that it can be used as material for developing the quality of blockchain transaction services and innovation in integrating banking services in adopting blockchain networks in Indonesia.

Thus, several hypotheses regarding the acceptance of blockchain networks are proposed as follows:

H_1: Complexity has a significant effect on Interest in Using Blockchain Networks

Complexity in technological innovation is one aspect that is considered for testing and evaluation. It can efficiently answer the user's business needs. A complex technological innovation product allows users to make mistakes or misunderstandings that result in a lack of interest or even rejection of technology adoption (Min et al., 2019). For example, Blockchain network products are unique in several entities, such as network addresses and anonymous blockchain network types. It makes the understanding of different users that need to be facilitated to minimize errors in transactions to network addresses. This convenience was expected to increase user interest in conducting transactions using the

blockchain network (Al-Rahmi et al., 2019). Previous research has also stated that the complexity of technology affects user interest (Shah et al., 2018).

H_2: Compatibility has a significant effect on Interest in Using Blockchain Networks

The development of technological innovation needs to pay attention to the aspect of compatibility or suitability of utility in everyday human activity. Today, the suitability of the modern era can be formed of compatibility in terms of technology, lifestyle, and mechanisms (Arias-Oliva et al., 2021; Flight et al., 2011). Furthermore, suitability in the technological aspect represents the need for technological infrastructure or devices to support blockchain network transactions. In contrast, in the aspect of lifestyle and current mechanisms, it is compatible with daily activities that require transactions using the blockchain network. In addition, previous studies have shown that user compatibility affects user interest in using technology (Chang et al., 2020; Kim et al., 2017).

H_3: Relative Advantage has a significant effect on Interest in Using Blockchain Networks

Technological innovation is created due to a problem that requires effective and efficient resolution steps. Therefore, technological innovation is expected to provide a relative advantage for users. With a technological innovation that can answer needs and provide relative advantages for users, users can be interested in adopting and using the technology (Lin & Chen, 2012). In implementing blockchain networks, user needs that can be answered are related to anonymity, ease of transacting internationally and locally, and investment allocation. So, the availability of added value provided by the blockchain network is expected to increase user interest in using these technological innovations. In addition, previous research suggests that relative advantage affects an interest in using a technology (Chung, 2014; Wong et al., 2020).

H_4: The perception of cost has a significant effect on the Interest in Using Blockchain Networks

Utilizing technological innovations such as blockchain networks is the same as digital banking services, where the infrastructure requires operations and maintenance costs. For example, in the case of blockchain networks, user transactions are used to finance the operations of miners who provide mining infrastructure (Pham et al., 2022). However, the cost competitiveness of blockchain networks with digital banking needs to be considered because the cheaper the fees charged by users, the more interested in using blockchain networks users will be (Wong et al., 2020). This can then increase the number of users of the blockchain network transactions. In addition, previous research also explained that cost affects an interest in using technology (Anouze & Alamro, 2019; Wong et al., 2020).

H_5: Financial Literacy has a significant effect on Interest in Using Blockchain Networks

The blockchain network is a technological innovation inherent in digital assets and currencies that makes the blockchain network itself part of a financial product so that financial literacy can act as knowledge, drafters, and filters for users in the implementation of a transaction (Stolper & Walter, 2017). Thus, users of blockchain network transactions need to have the fundamentals of financial literacy. In addition, previous research also states that users' financial literacy influences their interest in using digital currency (Arias-Oliva et al., 2019).

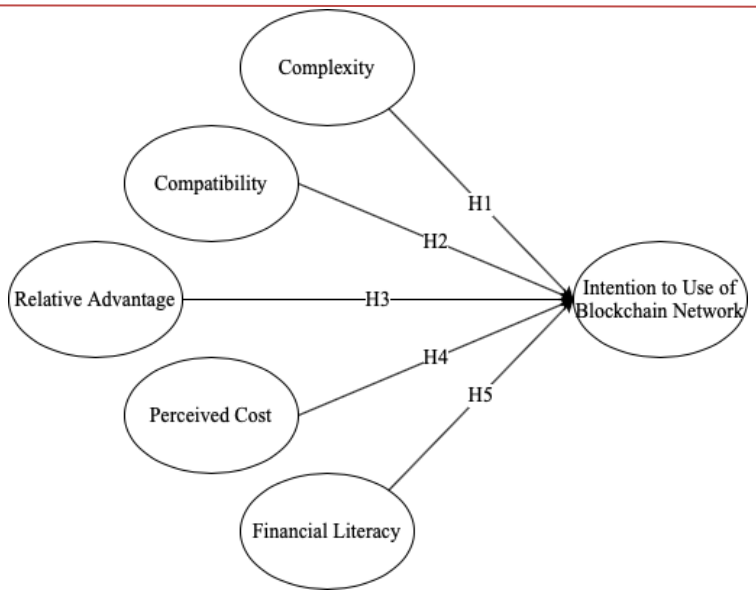

Figure 1. Conceptual Framework

2. Research Method

This research is conducted in a quantitative method. The data used are primary data collected from questionnaires with a Likert scale of 1 to 7. The indicator with number 1 represents the condition "Strongly Disagree," and number 7 represents the condition "Strongly Agree." Statements on indicators for each variable were adopted and adapted from previous studies such as (Almobarraz, 2007), (Tan & Teo, 2000) and (Laukkanen & Cruz, 2009) for the 3 complexity (CX) indicator variables (Koenig-Lewis et al., 2010) and (Al-Jabri & Sohail, 2012) for 3 indicators of compatibility variable (CB), (Al-Jabri & Sohail, 2012) for 5 indicators of relative advantage (RA), (Singh & Srivastava, 2018) for 3 indicator variables perceived cost (PC) and (Arias-Oliva et al., 2019) for 2 indicators of financial literacy (FL) variables. The population in this study are users of blockchain network transactions and digital currency. Furthermore, to generalize the majority statement, the sampling technique used in this study uses purposive sampling because certain criteria need to be met to become respondents in this study, namely at least having transacted using the blockchain network and having an account on an exchange or digital currency wallet. This study's minimum number of samples was calculated based on 20 times the number of independent variables (Hair et al., 2019). In order of that, it was found that the minimum sample size in this study was 100 people.

The data analysis in this study integrates two methods, SEM-PLS and neural network. The SEM-PLS method is used to analyze the effect of the independent variable on the dependent. Meanwhile, the neural network is used to analyze the relative importance of the independent variable in explaining the dependent variable. The SEM–PLS method consists of two stages: the measurement model and the structural model. The measurement model tests the validity and reliability of variables and indicators regarding the average variance extraction (AVE) value, Cronbach's alpha, composite reliability, and factor loading. While the structural model aimed at testing the proposed hypothesis. In the neural network, the steps taken are modeling, cross-validation, and sensitivity analysis. First, modeling on the neural network is used to determine the independent variables that previously affected the dependent variable for further analysis of their relative importance.

Furthermore, the validation of the neural network is used to measure the accuracy of the neural network model using K-fold cross-validation. Then the sensitivity analysis is used to measure the relative importance of the variables that affect the dependent variable using the Garson Algorithm. The tools used to analyze this study's SEM– LS methods are SmartPLS 3.3.0 and R Studio 2022.7.0 for neural network analysis.

3. Results and Discussion

3.1. Results

This study used research subjects with the criteria of users of blockchain network transactions collected by 100 users. The demographics of the respondent's questionnaires were measured from two aspects: the type of blockchain network used and the age of the blockchain network users. Regarding network type, the survey results showed that the blockchain network is dominated by BEP20 users, representing 70% of the sample. Furthermore, the second and third largest users are users of the ETC20 blockchain network and others, as many as 17% and 8% of the total sample. The last order is BTC network users, only 5% of the sample. Based on the second aspect, it can be viewed from the number of users. Based on the survey results, transaction users using the blockchain network are dominated by young people or Generation Z with an age of fewer than 25 years, about 76% of the sample, and the rest are users aged 25 to 40 with 24. % of the sample. Furthermore, the data will be analyzed using the SEM–PLS method to analyze the proposed hypothesis.

The SEM–PLS method is divided into two stages, namely the measurement model and the structural model. The measurement model tests test the validity and reliability of indicators and variables. In the indicator validity test, the indicator being reviewed was factor loading, where if an indicator had a factor loading value above 0.7, it could be said to be valid. Figure 2 below shows each variable indicator's factor loading results. The figure shows that all indicators have a factor loading value above 0.7, so it can be concluded that all indicators can be said to be valid.

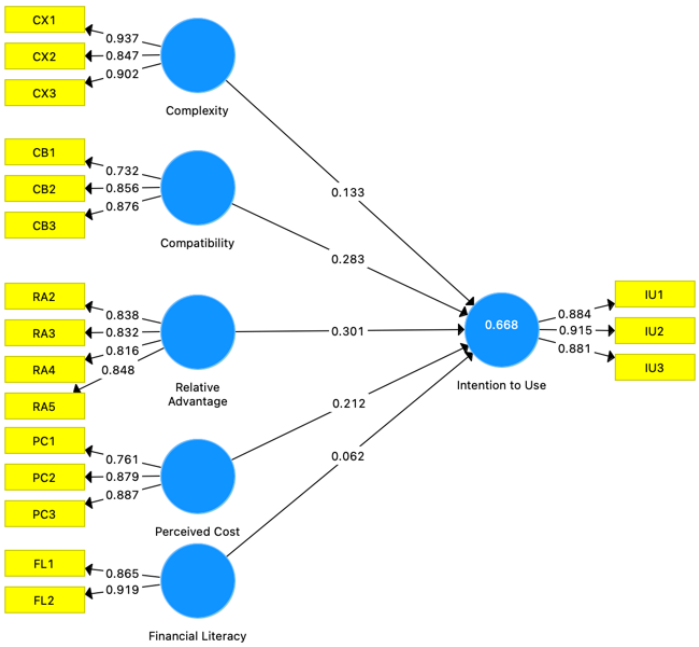

Figure 2. Path Analysis
Source: Analyzed with SmartPLS 3.3.0

After testing the validity level of indicators, the next test is carried out at the variable level in terms of the convergent and discriminant validity tests. In the concurrent validity test, a variable can be convergently valid if it has an Average Variance Extracted (AVE) value above 0.5. Table 1 below shows that the AVE value of the variables in this study ranged from 0.678 to 0.803 or above 0.5, so it can be concluded that all variables in this study were convergently valid. While testing the discriminant validity, the test compares the AVE root value with the intercorrelation value between variables to ensure that the two variables are compared conceptually and do not have unidimensional meaning. Therefore, the AVE root value must have a value greater than the intercorrelation value so that the variable can be said to be discriminantly valid. Table 1 shows that the AVE value of each variable is greater than the value of the intercorrelation comparison; thus, all variables in this study are discriminant and convergent. After conducting both convergent and discriminant validity tests, the test that must be carried out on the measurement model is the reliability test. The reliability test is indicated by the value of Cronbach's alpha and composite reliability above 0.7. Table 1 shows that each variable has Cronbach's alpha and composite reliability values above 0.7, so it can be concluded that all variables in this study are reliable or reliable.

Table 1. Discriminant Validity, Convergent and Variable Reliability

	CB	CX	FL	IU	PC	RA	Cronbach's Alpha	Composite Reliability	AVE
CB	**0.823**						0.764	0.863	0.678
CX	0.480	**0.896**					0.877	0.924	0.803
FL	0.562	0.596	**0.893**				0.749	0.887	0.797
IU	0.732	0.577	0.564	**0.893**			0.874	0.922	0.798
PC	0.672	0.391	0.475	0.631	**0.845**		0.800	0.881	0.713
RA	0.689	0.625	0.541	0.717	0.490	**0.833**	0.853	0.901	0.695

Source: Analyzed with SmartPLS 3.3.0

After completing the validity and reliability tests at the measurement model stage, the next stage of the SEM–PLS method was a structural model. In this stage, the aim was to measure hypothesis testing and related factors such as the determinant coefficient (R^2) and Goodness of Fit (GoF). In testing the value of the determinant coefficient, this value showed the real influence of the independent variable on the dependent variable, so outside this value was the percentage value influenced by other variables outside the independent variable in this study. The value of R^2 on the intention to use variable was 0.668 or 66.8%. It can be interpreted that independent variables (complexity, compatibility, relative advantage, perceived cost, and financial literacy) significantly affected interest in using blockchain networks by 66.8%. The number of 33.2% could be influenced by independent variables outside of the mentioned above. Furthermore, in GoF testing, a model can be of good quality if it has a GoF value above 0.36, moderate quality with a value above 0.25, and poor quality with a value of about 0.1. The GoF value itself is calculated by multiplying the root of the average variable AVE value by R^2. Based on the results of these calculations, it was found that the GoF value for the model in this study was 0.706, so it can be concluded that the model in this study has good quality. The last stage of the structural model is hypothesis testing. A hypothesis can be accepted if it has a t-statistic value of more than 1.64 and a p-value of less than 0.1. So that in Table 1 showed that H_1 is rejected ($\beta = 0.113$; $t = 1.459$; $p = 0.145$), H_2 is accepted ($\beta = 0.283$; $t = 2.312$; $p = 0.021$), H_3 is accepted ($\beta = 0.301$; $t = 2.490$; $p = 0.013$), H_4 is accepted ($\beta = 0.212$; $t = 2.640$; $p = 0.009$) and H_5 is rejected ($\beta = 0.062$; $t = 0.778$; $p = 0.437$). Thus,

it can be concluded that complexity and financial literacy have no significant effect on interest in using blockchain networks. In contrast, compatibility, relative advantages, and perceived costs significantly affected interest in using blockchain networks.

Table 2. Hypothesis Test Result

Hypothesis	Coefficient	T statistics	P values	Keterangan
H_1 Complexity -> Intention to Use	0.133	1.459	0.145	H_1 rejected
H_2 Compatibility -> Intention to Use	0.283	2.312	0.021**	H_2 approved
H_3 Relative Advantage -> Intention to Use	0.301	2.490	0.013**	H_3 approved
H_4 Perceived Cost -> Intention to Use	0.212	2.640	0.009***	H_4 approved
H_5 Financial Literacy -> Intention to Use	0.062	0.778	0.437	H_5 rejected

****Signifikansi 1%*
*** Signifikan 5%*

After testing the hypothesis on the SEM–PLS method, the variables that have a significant effect are forwarded to the neural network method using the Garson Algorithm to measure the relative importance of the variables. The initial stage of the neural network method was modeling, where the neural network model itself consists of an input layer, a hidden layer, and an output layer. In the input layer, the nodes used are variables from the SEM–PLS analysis, which significantly influence intention to use, such as compatibility variables, relative advantage, and perceived cost. The data used in the input layer is normalized using min-max normalization first to 0 to 1. After that, it can be adjusted to the number of values of other input variables. In the hidden layer, the node used contains a sigmoid activation function where the activation function is used to convert so that the output from the neural network remains on a scale of 0 to 1. The Garson Algorithm can only convert values from 0 to 1. In addition, the number of nodes in the hidden layer. The optimal one was 1 to 10 (Wang & Elhag, 2007), which is determined by selecting the model with the number of nodes with the smallest Root Mean Square Error (RMSE) value. In this case, 9 nodes in the hidden layer have the smallest RMSE value. Furthermore, in the output layer, the nodes in that layer only consist of the output intention to use where the variable becomes the object of measuring the importance of each node in the predetermined input layer. The results of the neural network modeling in this study can be visualized in Figure 3.

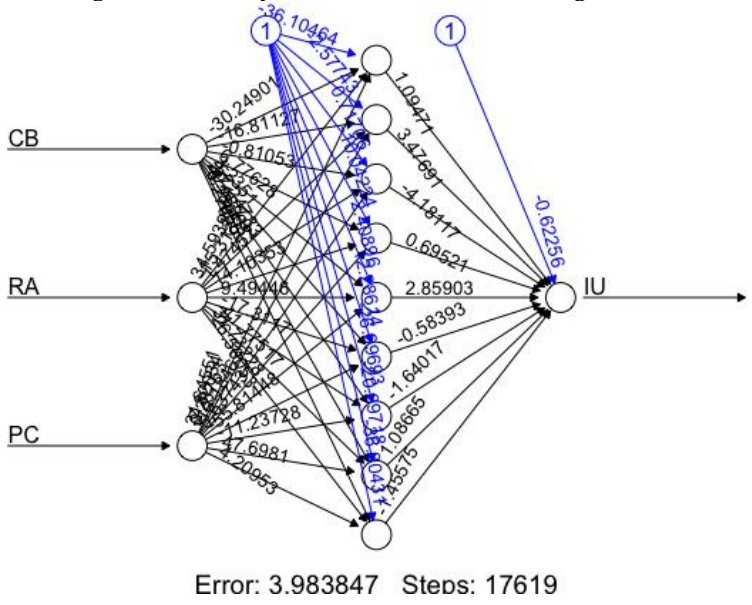

Figure 3. Neural Network Modeling
Source: analyzed with R Studio 2022.07.0

After modeling for the input, hidden, and output layers in the neural network model, the next step is to evaluate by calculating the RMSE value for each number of nodes in the hidden layer where the number of simulated nodes is 1 to 10 nodes. The evaluation of the RMSE calculation uses the K–fold cross-validation method with a total of k=10. In this stage, it also separated the data into training data and testing data with a ratio of 80:20 with the aim that the training data is used to train the algorithm and the testing data to test the algorithm's performance. Based on the evaluation results in Table 3, the number of 9 nodes has the smallest RMSE value, where the RMSE in the training data is 0.299, and the testing data is 0.202. So, it can be concluded that the neural network model in this study is optimal by using 9 nodes in the hidden layer.

Table 3. RMSE Score Based On The Number Of Node Hidden Layer

Hidden Node	Training	Testing
1	0.6274025	0.5314382
2	0.574616	0.5105597
3	0.5303462	0.4771161
4	0.455478	0.4267637
5	0.5305151	0.4667069
6	0.5105431	0.3570119
7	0.4056513	0.4516236
8	0.3071757	0.3529734
9	0.2989098	0.2024755
10	0.2495689	0.3551815
Average	**0.44902066**	**0.41318505**
S. D.	**0.12866465**	**0.098106**

Source: analyzed with SmartPLS

After determining the optimal neural network model, the next step is to measure the relative importance of each predictor variable to the response variable. For example, the relative importance value in table 4 shows the results of the intention to use a variable where each predictor variable, such as RA, CB, and PC, has a relative importance value of 0.454, 0.282, and 0.264 or, if normalized each variable becomes 100%, 62.08%, and 58.21%. So, it can be concluded that the relative advantage variable is the most important in explaining the interest in using blockchain networks. This is followed by the perceived cost and compatibility variables.

Table 4. Predictor's Relative Interest Value

Variable	Relative Interest	Normalized Relative Interest
CB	0.2642486	58.21%
RA	0.4539479	100.00%
PC	0.2818034	62.08%

Source: analyzed with SmartPLS

3.2. Discussion

The SEM– LS method results in the conclusion of the hypothesis that there is an influence between compatibility, relative advantage, and perceived cost on transaction interest with the blockchain network. On the other hand, users' complexity and financial literacy do not affect their interest in blockchain transactions. Furthermore, the neural network identified that the relative advantage of the blockchain network is the most important variable in influencing user interest in transactions. Then the next most important variables are

perceived cost and compatibility. Based on the results of the analysis carried out in this study, there are practical implications as follows:

In the first hypothesis, the study's results show no effect of complexity on the interest in using blockchain networks. However, the results in this study are not in line with the research proposed by (Shah et al., 2018), which states that complexity affects user interest in adopting technology. The complexity of technology becomes one of the barriers for users to adopt and use it (Davis, 1989). This shows that technological developments require users to adapt to the complexity of technology that supports the effectiveness and efficiency of daily activities. In the case of blockchain networks, the complexity of using it is when making transactions where the wallet address of the recipient of the funds does not have a name for security reasons, and there is only an encryption code. This can be minimized from the aspect of transfer errors by having a matching pin or code system between the sender and receiver.

In the second hypothesis, the study results show an influence between compatibility and interest in using blockchain networks. So the results of this study align with research conducted by (Chang et al., 2020) and (Kim et al., 2017), which state that compatibility influences interest in using technology. This shows that it is very important for developers to provide a technological innovation that is in line with users' social and economic conditions and facilities. With the compatibility with user conditions, it is hoped that the technological innovations created will be easily accepted by the user community. In addition, technological innovations created are also expected to need to adapt to the environment and culture around the user. In the case of innovation in the use of blockchain networks, device compatibility is one of the main factors for users to consider a transaction using the blockchain network. Therefore, the development of blockchain networks is expected to be compatible with minimum device specifications.

In the third hypothesis, the results of the study show that there is an influence between relative advantage on the interest in using the blockchain network. So the results of this study align with research conducted by (Wong et al., 2020) and (Chung, 2014), which state that there is an influence of relative advantage on interest in using technology. The research results from the neural network method also support that relative advantage is the most important aspect in influencing user interest in using the blockchain network for transactions. This is because innovation is created to answer the activity needs of individual users and organizations to make it more effective and efficient. So that in the creation of innovation, the relative advantage that becomes a breakthrough from the previous business process or activity must have the distinction and novelty that makes it easier for users. In the case of blockchain networks, the security of privacy in transactions is one of the main icons that becomes a relative advantage. So that the further development of the blockchain network is expected to increase the percentage of guarantees for the security of user transactions using the blockchain network.

In the fourth hypothesis, the study results show an influence between perceived cost and interest in using blockchain networks. So the results of this study are in line with research conducted by (Anouze & Alamro, 2019) and (Wong et al., 2020), which state that perceived cost influences interest in using technology. Technological innovations that are created have several variable costs, such as research and development costs to maintenance costs.

However, these costs are hoped to be reduced to increase user interest in adopting a new technological innovation. In the case of blockchain networks, the fees charged vary widely, ranging from the cheapest, like the BEP20 network, to the most expensive, like the BTC network. So to support business sustainability, developers can use strategies to reduce transaction costs with the blockchain network.

In the fifth hypothesis, the study results show no influence of financial literacy on interest in using blockchain networks. Thus the results in this study are proven to be inconsistent with the research proposed by (Arias-Oliva et al., 2019), which states that there is an influence between financial literacy on interest in using digital currencies. In practice, current financial literacy theory is too less relevant to the development of technological aspects with financial conditions, so there needs to be an update related to the measurement of financial literacy that is integrated with technological aspects, which can then be called digital financial literacy. So with this proposal, the measurement of financial literacy can be adjusted to the current innovative technological developments.

4. Conclusion

This finding indicated relative advantage, compatibility, and perceived cost influence on the interest in using the blockchain network. In contrast, the variables of complexity and financial literacy have no significant effect on user interest in blockchain networks. On the other hand, the relative advantage variable was the most important in influencing user interest in the blockchain network. It's caused by some benefits felt by users of a blockchain network in conducting transactions had become an innovation that can answer users' business needs. So, it can be concluded that today, blockchain network innovation is one of the inventions that can compete with other digital banking services. In addition, the perception of cost and compatibility of user conditions is also a consideration for users in adopting and using blockchain networks.

Based on the findings above, it was found that several limitations could be a plan for further research. First, this research is limited to implementing the neural network as a machine learning method representing deep learning. So, further research is expected to compare the quality and accuracy of deep learning methods with ensemble learning methods such as stacking, bagging, and boosting. Second, the implementation of the current blockchain network is growing on the adoption of web3, NFT, and other technological innovations. Because of that, further research is expected to be able to use the object of technological innovation as a measurement of adoption readiness in the community. Third, this research model is limited to developing the diffusion of innovation theory in measuring blockchain network adoption. Thus, it's expected that further research will develop new theories that can measure the readiness to use technological innovations.

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