

Antecedents of using electronic money application on technology communication during covid-19 pandemic

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ARTICLE INFO

Article history

Received 2021-07-29

Revised 2021-07-30

Accepted 2021-08-13

Keywords

Technology Acceptance Model

Perceived Ease of Use

Perceived Usefulness

Attitude Toward E-Money

E-money Technology Use

ABSTRACT

This paper aims to evaluate and discover the effect of perceived ease of use, perceived usefulness, attitude, and e-money applications use. The research data comprised primary data obtained from online questionnaires, distributed to 100 respondents of e-money users selected with a purposive sampling method. Aided with AMOS analysis tools, the Structural Equation Modeling (SEM) was employed for the data analysis. Findings revealed that perceived ease of use had significant effects on 1) perceived usefulness, and 2) the use of e-money applications. Perceived usefulness significantly affects attitude. Attitude has significant influences on the use of e-money applications. Also, perceived fully mediates on the effect of perceived ease of use on attitude. The effect of perceived usefulness on the use of e-money applications is fully mediated by attitude as the mediator. Besides, the effect of perceived ease of use on attitude is statistically non-significant, implying that it does not mediate the effect of perceived ease of use on the use of e-money applications.

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1. Introduction

Today, electronic, information, and communication technology development changes human economic behaviours. The technology transforms their conventional shopping behavior in shops, supermarkets, or malls into alternatively surfing the internet for shopping. Online shopping promises convenience as it is not bound to either space and or time. Also, the changes to more practical and secure payment methods it provides, contribute to online shopping behavior changes. The conventional payment medium of paper money or coins has also evolved to electronic money or the so-called electronic or digital money (e-money). Apparently, it has become known as a markedly new system of payment in the world of modern business [1].

Presently, as e-money begins to develop in Indonesia, the economic and financial transactions are rapidly increasing along with the use of digital platforms and instruments during the pandemic and the growing public preference [2]. To date, the number of users of e-money transactions in Indonesia on mobile phones exceeds 12 million users. It indicates that the use of e-money has not been fully benefited as the number occupies six percent of the total mobile phone users in Indonesia [3]. The facts that merchants providing e-money transactions are limited, e-money cannot be used for offline transactions, people are not familiar with electronic money, credit top-up is subject to fees, and people prefer other payment methods stand in the way of e-money usage [4]. In addition, traditional markets and conventional shops accept more cash than electronic money.

The current Covid 19 pandemic quickly spreading throughout the world has triggered a drastic shift in the market environment. Avoiding crowds and maintaining health protocols are vital. This has brought big changes in consumer shopping behavior, as they shift from physical markets to shopping online cash to cashless payment [5]. During the pandemic, most citizens are encouraged to use online payment methods because of the physical distancing policy promoted by the World Health Organization (WHO) [6]. Davis in 1989 introduced TAM, Technology Acceptance Model, extensively discussing technology acceptance and utilization. This theory analyzes the relationship between perceived ease of use, perceived usefulness, attitude, and actual use of technology. The perceived ease of use deals with the perception of one's ease when utilizing technology. Perceived usefulness is about the perception of the benefits obtained from using technology, attitude discusses one's attitude to technology and the actual use copes with the real use of technology [7].

Several comprehensive studies suggest that ease of use strongly influences technology use [8]. Morosan stated that the ease of using technology will strengthen the perception that technology primarily determines further performance enhancement [9]. This signifies that the easier the perceived use of technology, the higher the perceived benefits derived from a particular technology utilization. Also, there is a logical connection between perceived ease of use and one's attitude to technology. This implies that the easier the perceived use, the more positive one's attitude to technology [9]. The perceived ease in using the technology will lead to high acceptance of the technology [10]. The high value of the usefulness of a technology one feels can affect one's attitude to the technology [11] [12][13] [14]. One's positive attitude will affect how someone takes real action to use the technology [15].

Bali is one of the provinces in Indonesia that has a high population density and income distribution. As economic centers in Bali, Denpasar City and Badung Regency highly need advanced communication tools and technology, one of which is the utilization of e-money. Although the number of e-money users in Indonesia remains low, cashless financial transaction services and elektronification in Bali continue to show rapid growth. One indicator is the increasing number of electronic money (e-money) usage [16]. During the pandemic, e-money is the alternative transaction method to minimize direct contact with cash. This is an interesting issue to analyze regarding the acceptance of e-money in Bali during the pandemic. This phenomenon becomes the basis of our research on factors that can influence a person's decision to use e-money applications on their smartphones.

This paper takes TAM as the theoretical basis for predicting how individuals behave in using e-money. This paper investigates the perceived ease of use considerable effect upon attitude, actual use of e-money and perceived usefulness. It also investigates perceived usefulness and attitude relationship with the effect of attitude upon the actual use of e-money. Besides, this paper underlines the prominence of the mediating role of perceived usefulness and attitude in the model of using e-money technology.

2. Theoretical Framework

2.1 Consumer Behavior

The decision to use technology is closely related to one's behavior. Latest digitalization and innovation development incredibly accommodate buyers to appreciate a more customized way of life utilizing cell phones, online media, and on-request administration contributions [17], affecting and reshaping the long-established customer conduct and patterns, from in-store purchase to computerized shopping [18]. Customer conduct is essential to comprehend "what they do and why they do so". Investigation of customer conduct deals with how an individual settles on choices to dispense accessible assets (time, cash, exertion, and energy) [19]. Consumer behavior will affect one's purchase decision. The purchase decisions are the result of a thorough cycle including expansive item data research, brands plan assessment, quality, and value examination. The accomplishment of impacting purchase decision generally rely upon how great the association comprehends and fulfill customer conduct to transform it into the purchase decisions [20].

2.2 Technology Acceptance Model

Newly introduced by Davis in 1989, TAM was an adaption of the Theory of Reasoned Action (TRA), a theory introduced by Fishbein and Ajzen to tell in advance one's behaviour on the basis of

his/her intentions and attitudes [21]. The model shows one's behavior toward technology which is indicated by his/her desire to voluntarily use the technology [7, 21, 22, 23]. The attitudes are shaped by one's beliefs. They are the perceived usefulness and perceived ease of use [24]. They both are significant variables affecting someone to exercise technology for particular purposes [25]. In line with this, Davis concluded that perceived usefulness, perceived ease of use, and attitude give direction personal motivation behind his/her preference to use a system [26].

2.3 Perceived ease of use (PEOU)

It is about the representation of what consumers perceive or believe that the use of technology is bereft of great effort and applications that are functional and easy to use [9]. In addition, PEOU deals with the degree of ease perceived by someone in using the applications [27]. Based on this understanding, the perceived ease of use denotes the quality to which an individual feels free from a great effort to use technology.

2.4 Perceived usefulness (PU)

This is the major determining factor when someone utilizes technology. The perceived usefulness reflects the measures of users believing that it helps their tasks or work performance [9]. The value of perceived benefits refers to the expected value from the use of a particular information system [15]. Perceived usefulness is a person's level of trust in a technology that can help increase their activities at work. Based on this explanation, PU suggests the scale of benefits people recognize when using information technology in helping their performance.

2.5 Attitude (ATT)

Attitude is one's feelings (evaluative influence), both positive and negative about the target behaviors [28]. Attitude is a person's tendency to respond to objects consistently, either in liking or disliking [15]. This concludes that attitude is a person's response to an object so that it creates a positive or negative feeling that can be conceptualized as final approval of the use of technology.

2.6 Actual application use of e-money

The use of e-money applications alludes to a person's decision to use the application for shopping needs. When deciding to buy, consumers must decide on the type of brands, products, time of purchase, quantities, sellers, and payment method. In this paper, purchasing decisions mean that consumers make decisions to use e-money for shopping purposes.

3. Method

The research was conducted in Denpasar, Bali. The types of data used are primary and quantitative data obtained from questionnaires. The questionnaires were a Google form distributed online via Whatsapp. The questionnaires were divided into two parts. The first part collected the respondent demographics comprising age, occupation, gender, and income. The second part of the questionnaires is to measure the constructs of PEOU, ATT, PU, and the use of e-money. This research involved 100 respondents as the sample selected by a purposive sampling method under the criteria that they were 17 years old and had used e-money applications, such as OVO, and Shoppe Pay. To measure the variables, we used a 5-point Likert scale of 1 (strongly disagree) to 5 (strongly agree). Before testing the primary data, a pilot test was administered to 30 respondents to measure the validity and reliability of the questionnaires.

As for the hypothesis testing, we used Structural Equation Modeling (SEM). The series of statistical computer programs (software) used to process the data are SPSS for Windows version 17 and AMOS version 18. The analysis of mediating variables can be done through the examination method [29].

3.1. Validity and Reliability Test

Table 1 displays the results of the instrument validity test. It shows that all item correlation coefficients in each of the variables studied have a value of more than 0.3, so that the items used in this study are declared valid and feasible to be used for all targeted respondents. The results of reliability testing signify that all constructs have a Cronbach's Alpha value of higher than 0.6. This signals that the indicators contained in the form of statement items in the questionnaire have reliability in measurement.

Table 1. The results of the validity and reliability test

Variable	Indicator	Correlation Coefficient	Alpha Cronbach	Variable	Indicator	Correlation Coefficient	Alpha Cronbach
<i>Perceived Ease of Use (X1)</i>	The e-money application is easy to learn	0.926	0.91	<i>Attitude (Y1)</i>	Transactions with e-money are preferred to cash	0.822	0.832
	It is simple in using an e-money application	0.943			It is enjoyable to use e-money for any transactions	0.824	
	It is easy to follow the instructions for using the e-money application	0.902			I am sure to use the e-money app for shopping	0.848	
			I am not bored using e-money as a shopping facility		0.797		
<i>Perceived Usefulness (X2)</i>	The e-money application makes shopping transactions easier	0.855	0.884	<i>Actual Use Application of e-money (Y2)</i>	Using e-money application for shopping	0.875	0.894
	The e-money application helps the payment process to be faster	0.871			Using e-money applications for purposes other than shopping	0.856	
	The e-money application makes shopping more efficient	0.851			Always looking for shops that can use e-money applications	0.815	
	The e-money application can be used for transactions anywhere	0.874			Always looking for shops that can use e-money applications	0.934	

3.2. Hypothesis

1) The effect of PEOU on the actual use application of e-money

Al-Suqri [30] argued that PEOU and behavior to utilize technology have significant relationships with the actual use of technology. Besides, the ease of use of technology has a great effect on the use of technology [31]. Perceptions of the ease of use of technology will affect the voluntary use of technology. The ease when following the instructions on the application will build a person's belief to use it [32]. These suggest our hypothesis:

H₁: Perceived ease of use has positive and significant effects on the actual use application of e-money.

2) The effect of PEOU on ATT

The ease of using technology will affect one's attitude towards technology [13]. One's high perception of the ease of using technology will affect his/her attitude towards technology [33]. The level of ease that a person perceives of technology affects a positive or negative attitude leading to acceptance or rejection of technology. The level of ease of using technology supported by the ease of learning technology will provide a positive response to the technology [30]. From the results of these studies, we hypothesize that:

H₂: Perceived ease of use has positive and significant effects on attitudes in e-money applications.

3) The effect of PEOU on PU

Perceived ease of use has significant effects on perceived usefulness [34, 35]. The easier the use of technology entails higher levels of utilization of the technology [36]. The ease of using technology will give the impression that the use of technology enables the work process to be faster and easier. The convenience that someone perceives will lead to a perception that using technology will speed up work. Following the research, the third hypothesis is:

H₃: Perceived ease of use has positive and significant effects on perceived usefulness.

4) *The effect of PU on ATT*

As PU has positive and significant effects on ATT [37, 38], the perceived benefits of using technology will provide a positive attitude towards the technology [39]. The perception of the benefits of technology will lead to an acceptance or rejection of the use of the technology. Technology that can make work easier will be favored and accepted. On this basis the hypothesis in this study is:

H₄: Perceived usefulness has positive and significant effects on attitude.

5) *The effect of ATT on the actual use application of e-money*

Lee underlined a positive significant relationship between attitude and the use of technology [33]. Attitude has significant effects on technology utilization and it has a great impact upon the use of technology. This implies that someone who accepts a technology well will voluntarily use the technology [28]. A positive attitude towards technology will affect someone to use technology significantly [40]. On this basis the hypothesis in this study is:

H₅ : Attitude has positive and significant effect on the actual use application of e-money.

6) *The role of mediation*

As clarified in the past research results, the direct relationship between PEOU and PU [36] and the relationship between PU and ATT [39]. From the three connections, PU can be a mediating variable on the effect of PEOU. The same thing goes to the direct effect of PU on ATT [38], where attitude also has a significant effect on the use of technology [28]. From these three variable relationships, attitude can mediate the effect of perceived usefulness on the use of technology. Attitude with perceived usefulness is also expected to act as a mediating variable between the effect of perceived usefulness on the use of e-money. On these bases, we hypothesize:

H₆: Perceived usefulness serves as a mediating variable on the influence of perceived ease of use on attitude

H₇: Attitude serves as a mediating variable on the effect of perceived usefulness on the actual application use of e-money

H₈: Attitude serves as a mediating variable on the effect of perceived ease of use on actual application use of e-money.

4. Results and Discussion

4.1 Analysis of Measurement Model

The measurement model analysis with the confirmatory factor analysis is intended to confirm the whole indicators that form a construct. The analysis of the measurement model is delivered in Table 2. Table 2 confirms that all variables are valid since the loading factor value is higher than 0.7 [41].

Table 2. Measurement model analysis

<i>Variable</i>	<i>Indicator</i>	<i>Factor Loading</i>
<i>Perceived Ease Of Use (PEOU)</i>	X1.1	0.884
	X1.2	0.890
	X1.3	0.881
<i>Perceived Usefulness (PU)</i>	X2.1	0.589
	X2.2	0.845
	X2.3	0.753
	X2.4	0.809
<i>Attitude (ATT)</i>	Y1.1	0.769
	Y1.2	0.752

	Y1.3	0.726
	Y1.4	0.852
<i>Actual Use of Application</i>	Y2.1	0.828
(AUA)	Y2.2	0.838
	Y2.3	0.871
	Y2.4	0.883

4.2 The results of the model feasibility test

The test using the Structural Equation Model (SEM) is to examine the proposed hypothesis. Table 3 shows the model feasibility test. Table 3 displays the results of data processing. The results indicate that all the constructs used to build a research model have met the criteria of the goodness of fit. This means that the model fits the sample data.

Table 3. Evaluation of Criteria for Goodness of Fit Indices

Goodness of fit Index	Analysis results	Cut off Value	Evaluation of Model
<i>Chi-Square (CMIN)</i>	87.627	Expected small	<i>Good fit</i>
<i>Probability Level (p)</i>	0.401	$\geq 0,05$	<i>Good fit</i>
CMIN/DF	1.031	$\leq 2,00$	<i>Good fit</i>
GFI	0.896	$\geq 0,90$	<i>Marginal fit</i>
TLI	0.996	$\geq 0,95$	<i>Good fit</i>
CFI	0.997	$\geq 0,95$	<i>Good fit</i>
RMSEA	0.018	$\leq 0,08$	<i>Good fit</i>
AGFI	0.853	$\geq 0,95$	<i>Marginal fit</i>

4.3 Hypothesis testing results

Table 4 below presents the hypothesis testing results.

Table 4. Hypothesis Test Results

Hypothesis	Effect	Estimate	C.R	P	Description
<i>Direct Effect</i>					
H1	PEOU →AUA	0.223	2.608	0.009	significant
H2	PEOU →ATT	0.099	1.043	0.297	insignificant
H3	PEOU →PU	0.359	0.079	0.000	significant
H4	PU →ATT	0.488	0.182	0.007	significant
H5	ATT →AUA	0.467	0,131	0.000	significant
<i>Indirect Effect</i>					
H6	PEOU →PU → ATT	0.359x0.488	=	0.1752	
H7	PU →ATT→ AUA	0.488x0.467	=	0.2279	
H8	PEOU →ATT → AUA	0.099x0.467	=	0.0462	
Significance limit		≤ 0.05			

The research model is presented in Figure 1 below.

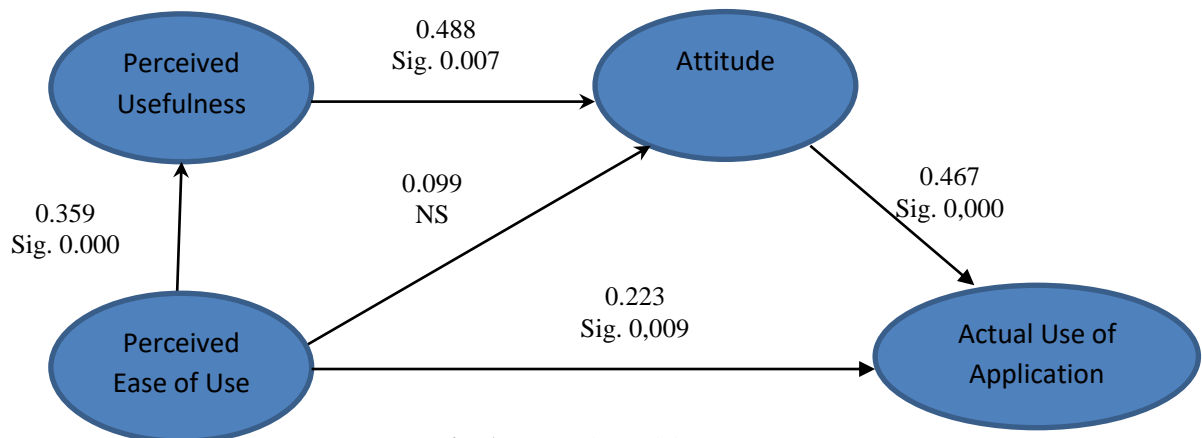


Fig. 1. Research Model

4.4 Direct effect

The principal theory offering that PEOU has positive and significant effects for the real use of e-money is adequate. The findings are consistent with the research by Al-Suqri [10], Harati [31], and Khafit [32]. This implies that the higher the perception of the ease of using technology, the higher the use of e-money applications. The convenience of utilizing e-money will build customer trust. Addedly, the simplicity of transaction providing customers with enjoyable shopping will lead to more frequent use of e-money.

The second hypothesis stating that PEOU has positive and significant effects on attitude is rejected. This contradicts the statements of Cho and Wang [13], and Dong [34]. This means that even if someone feels the ease of using e-money, he/she will not completely replace cash transactions with cashless ones (e-money). This is because in Indonesia there are not too many shops or merchants providing transactions using e-money, making it is more challenging to change someone's attitude from using cash to e-money. In addition, as e-money transactions require an internet connection, they cannot be carried out in places with poor internet access.

The third hypothesis stating that PEOU has positive and significant effects on PU is accepted. This is in accordance with the research by Demoulin [35], Dong [34], and Akturan [36]. This implies that the higher one's perception of the ease of using e-money, the higher one's perception of the value of the benefits obtained in using e-money applications. The easier it is to use the e-money application, the higher one's perception of the ease of using the e-money application. The ease and simplicity of the e-money payment method will make shopping more efficient due to abundant cashback offerings. In addition, the simplicity of the transaction increases its usefulness since it makes payments faster.

The fourth hypothesis providing that PU has positive and significant effects on ATT is accepted. The results of this research corroborate research [37, 39]. Someone who recognizes the benefits of using e-money transactions will prefer it to cash transactions. The efficiency creates one's happiness and allows him/her to enjoy various facilities e-money offers.

The fifth hypothesis which states that ATT has positive significant effects on the actual use application of e-money is accepted. This implies that the better the perception of the value of benefits, the more positive one's attitude towards technology will be [33, 42]. Someone's preference for transactions using e-money will affect his/her shopping behavior. Someone who already feels the pleasure of using e-money will use it for other shopping purposes and always look for stores that provide e-money payment methods.

4.5 Indirect effect

1) The mediating role of PU on the effect of PEOU upon ATT

The significance test shows that PEOU has no significant direct effect on ATT, PEOU has a significant direct effect on PU, and PU has a significant effect on ATT. In accordance with the examination model by Song and Lim [29], it can be concluded that PU serves as a full mediator in

mediating the effect of PEOU on ATT. This means that to increase the use of e-money applications, the ease of using e-money should give surety to increase one's perception of the benefits of using e-money applications. To ensure that e-money is preferred in transactions, e-money should possess the necessary strength to facilitate a faster and more efficient payment process. This makes e-money more acceptable as a means of payment.

2) *The mediating role of ATT on the effect of PU on the actual use application of e-money*

The significance test shows that the direct effect is significant and positive (unidirectional). The examination model leads to the conclusion that attitude plays a role as a full mediator in mediating the effect of PU on the use of e-money applications. This means that perceived benefits can increase the use of e-money applications by increasing one's attitude towards the application. To be preferred in transactions, the ease of using e-money must be proven to cater faster and more efficient payment process. This makes e-money more acceptable as a means of payment.

3) *The mediating role of attitude on the effect of PEOU on the actual use application of e-money*

The significance test also implies that PEOU has no significant direct effect on ATT, in addition, ATT and PEOU have positive significant effects on the use of e-money applications. In accordance with the examination model [41], it can be concluded that attitude does not serve as a mediating variable on the effect of PEOU on the use of e-money applications. This means attitude cannot mediate the perception of ease on the use of e-money applications. To increase one's confidence in using e-money, the benefits offered by e-money must successfully provide pleasure and enjoyment of shopping using e-money. Also, to increase the use of e-money, e-money must enable shopping to be more efficient and be widely used. E-money that makes shopping transactions easier must be able to provide shopping pleasure allowing the users to use it simply more than shopping.

5. Conclusion

Our analysis leads to the conclusion that perceived ease of use has a positive significant effect on the use of e-money applications and perceived usefulness. However, it has no significant effect on attitude. Also, perceived usefulness has a positive and significant effect on attitude and perceived usefulness fully mediates the effect of perceived ease of use on attitude. Attitude has a positive and significant effect on the use of e-money applications. Attitude partially mediates the effect of perceived usefulness on the use of e-money applications, however, attitude does not serve as a mediating variable on the effect of perceived ease of use on the use of e-money applications.

The implication of this study findings is that to increasing the use of e-money technology, the value of the benefits felt by consumers must be able to increase positive attitudes towards the use of e-money. This should be a concern for e-money providers. The effectiveness and efficiency of e-money promises should be deliberately promoted to raise significantly the number of merchants providing e-money.

As our analysis suggests that perceived ease of use has no significant effect on attitude, which is a contradiction with the original TAM model, it contributes to a new research concept regarding the acceptance of information and communication technology in developing countries such as Indonesia. This contradictory result reflects that technological developments will be able to change human behavior and the basic concept of the previously developed theory.

This study has several limitations. We used the technology acceptance model as a whole regardless of the important variables in influencing someone to use technology at this time. Future research shall include normative subject variables and the influence of the social environment. Furthermore, as the study merely used respondents in Denpasar and Badung Regency, future research should involve e-money users from wider areas to analyze differences in perceptions of e-money use.

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