

Building Trust: A Solution to Increase User's Satisfaction on E-Money Adoption

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Abstract

The main impetus of this study is to test empirically the antecedents of users' satisfaction on e-money adoption. Trust has been considered as a major concern for this study, which then stimulates system quality and user's participation. This study uses quantitative approach through an online survey of 117 e-money users in Indonesia. The tool of analysis is Structural Equation Modeling (SEM) with Partial Least Square (PLS) software. The result of this study revealed that high level of trust when followed by system quality and participation being a stimulant for higher level of users' satisfaction.

Keywords: E-money, trust, system quality, participation, users' satisfaction, PLS.

1. Introduction

Adoption of e-money in Indonesia is growing well. The use of e-money transactions has increased from IDR 5 billion in 2007 to IDR 30 trillion. Nowadays, approximately USD 7.7 billion rotates each day using e-money services such as e-wallet and prepaid cards in Indonesia¹.

Bank of Indonesia defines electronic money as any kind of money stored in a system such as a server or chip. The object is used by the consumer as an e-wallet service or pre-paid card. Both are very useful in countries that have a very low credit card penetration, because it helps the community to make online payments or save money for purposes such as paying a bus ticket or bill.

Most of banks in Indonesia have e-money products in the form of a prepaid card. This card can be used by anyone, and the bank usually cooperates with universities to integrate identity card of students into a prepaid card. These cards usually can store a maximum of 1 million rupiahs. With five million cards have been issued, Flazz is a leader and multifunctional prepaid cards from Bank Central Asia. Purchases and payment which can be done in second at more than 23,000 outlets available, then promo as diverse as free parking for the first hour in some places become advantages.

These advantages supported by state of the art technology such as: chip and Radio Frequency Identification (RFID). Hence, this study focused on Flazz as e-money product observed.

Given the fact that adoption rates of e-money in Indonesia have been increased significantly and their potential advantages for users, there is a strong need for examining the factors that influence users adoption. Few studies explored the adoption of e-money^{2,3,4,5}. As a part of new e-business product, trust has been considered as a major concern for this study, which then stimulates system quality and user's participation to adopt this product.

Diversity of studies through the domains that describe the dimensions and the debate about concept of trust have indicated the need for more specific analysis of the linkage between trust and satisfaction as the outcome of those trust's constructs^{6,7}.

The purposes of this study are congruent with the research questions that may be proposed from the model of linkage between trust and users' satisfaction, which are investigate:

- The effect of trust on system quality,
- The effect of trust on participation,
- The effect of participation on satisfaction, and
- The effect of system quality on satisfaction.

This paper is organized as follows. In the beginning, it presents the relevant background. It follows by the linkage of each variables to propose the hypothesis development. Then, it continued by research method and results to answer the research questions. In the last section, the conclusion and implication are discussed.

2. Background

This paper is motivated by empirical studies on trust which are still divergent. Divergent related to belief as a broad concept, because it covered variety of relationships in any aspect of human's life⁸. This view has later been studied from psychology, because it related to a person's attitude⁹. This study then led to the diversity of the trust's dimensions. This paper uses the most widely accepted views, which are dimension of credibility and benevolence^{10,11,12,13}.

Credibility refers to competency, honesty, and seller's reliability¹⁴; benevolence refers to seriousness of the seller's willingness to consider the welfare of buyers¹⁵. In this paper, trust as the function of credibility and benevolence dimensions is accordance with the opinion of Dimoka¹⁶. Dimoka's research used as reference because the model of this research was created by the perspective that construct of user's satisfaction is the function of trust in individual decision for using product or service which is also influenced by another constructs (system quality and users' participation), which was built through cognitive process and emotional from the trust.

This study discusses about the role of trust which has been widely accepted by information system's researchers, but there were still few people who did the study about distrust¹⁷. The scarcity of distrust's research comes from previous research that makes trust and distrust as the same construct at the opposite ends of a single continuum^{16,18}.

Contrary to the researcher who view trust and distrust as the same construct in the opposite ends, then some other researchers actually see trust and distrust appear simultaneously¹⁹. Empirical researches that state trust and distrust appear simultaneously are based on two distinct constructs and its correlation is low²⁰.

This paper refers to the perspectives of trust and distrust as distinct constructs, referred to the association with brain activity system's theory by Dimoka¹⁶ and the theory of Lewicki et al¹⁹. E-money card is used in this paper as one of the instrument on e-money context that exemplifies the process of trust based on the argument that congruent to Dimoka's research and theory of Lewicki et al.

3. Theoretical Framework and Hypothesis Development

Numerous empirical studies about trust, but rarely have they investigate trust as an antecedents of users satisfaction on e-money adoption. Some studies explored trust in technology as an important factor in the context of e-government and internet banking²¹, but few studies considered trust as antecedent in e-government^{22,23}, trust as antecedent to customer satisfaction²⁴, trust as antecedent in online tax-filing system which in turn directly influenced all three IS Quality dimensions²⁵, trust as antecedent to the attitude and intention to use mobile payment^{26,27,28,29}. Basically, trust can be divided into two types: trust in the entity providing the service and trust in technology^{22,23,30,31,32,33,34,25}.

3.1 The effect of trust on system quality and participation

Relationship between user trust and electronic quality's attribute generally explained through attribution theory that shows the perception and allegation which arise when people try to explain the others or their self actions^{23,35,24}. The trust of user toward vendor, merchant, and technology that are provided by vendor have been affected the valuation toward system quality from users. Trust toward electronic vendor involves trust that vendor will be responsible for guarantee the technical liability and the ease of use from e-money product, then encourage high quality perception of the e-money product innovation system.

User who trusts in merchant that manage vendor product will be able to face technical issues effectively to increase product usability. When users do not trust that they will get the certainty about detail of technical feature and various standard points from e-money product, they will show their dissatisfaction on product.

The trust of users decrease when they feel unsafe in using system and didn't find the practically and efficiency of this system, so that they will perceive that service which is given by the card is poor and cause dissatisfaction in using it³⁶. Associated with activity in brain system, trust toward system quality was driven by different neurological process in the prefrontal cortex, especially orbitofrontal cortex. Orbitofrontal cortex will stimulate cognitive process in human that related to perception or individual assessment in explaining things.

According to social exchange theory, people form a relationship of exchange with basic of trust³⁷. User participation also being a consequence of trust despite of system quality. User participation in system

development has already understood as critical factor in achieving success of information system³⁸.

User participation is a behavior, assessments, and activities performed by users or their representatives during the process of system development³⁹. The lack of trust will preclude participation in the use of e-money product because the uncertainty that contained from use of the product. Trust is the first condition for user's participation in e-money.

Participation of user in internet banking is measured with presence of community involvement in the use of certain product to do interaction and transaction⁴⁰. User participation will grow well if product service can support the trust that is given by user³⁷. Jung-Yu et al.⁴¹ also has investigated that trust and user participation being a significant driver of e-business satisfaction. Five cluster of IT features, which consist of usability, transparency, quality-assured content, security, and privacy has different impact on trust and participation⁴².

If user participation associated with brain activity system¹⁶, the benevolence dimension based on brain activity (neural) associated with limbic system. Limbic system is generally associated with social and emotional processes that activate interior area of brain (likes amygdala, caudate nucleus, putamen, and insular cortex) to encourage the rising of hope, reward, positive respond, and willing to cooperate or participate. Credibility dimension based on brain activity associated with prefrontal cortex also affect the user participation through a decision to declare the use of system is satisfy them. Therefore, it encourages them to participate using a product. Based on a review of the literature, the author develops these following hypotheses:

H1a: Trust has positive influence on system quality

H1b: Trust has positive influence on participation.

3.2 The effect of system quality and participation on satisfaction

Study which is conducted by Teo²³ found that system quality affect satisfaction which in turn affects the interest to continue for using e-government. System quality indicates perception about technical performance in obtaining and sending information. Prior research by Petter et al.⁴³ identified 43 determinants that provided influence the IS success. Subsequently, they examined which determinants affect the dimensions of IS success - system quality, information quality, service quality, intention to use, system use, user satisfaction, and net benefits.

Technically, product should provide easy access and timely to serve reliable information and protect function or ensure the safety of users when doing transaction in online banking website⁴⁴. Clear information, up to-date, accurate, correct, served by system that can be operated

easily, no-trouble, friendly service and fast both by vendor and merchant, encourage users to give high rating about product quality, which in turn leads to satisfaction toward product^{45,46,47,48,49}

Users' trust in influencing satisfaction relates not only to website's attributes likes system quality, but also users' participation. The extent to which users' participation will certainly affect satisfaction with the system. McKeen et al.⁵⁰ found that users' participation in the system development directly affects users' satisfaction and system usage. Users' participation in system development should lead to greater commitment, involvement, acceptance, usage, and ultimately gain greater satisfaction^{51,52,53,54}. Based on those literature reviews, the author develops these following hypotheses:

H2a: System quality has positive influence on satisfaction

H2b: Participation has positive influence on satisfaction

The linkages among variables within hypothesis development are depicted in proposed research model as figure 1 below:

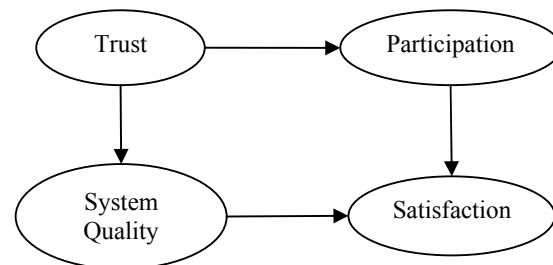


Fig 1. Research Proposed Model

4. Research Method

Quantitative research design had been selected in order to find out the appropriate answers to the research questions and to test the hypotheses. Survey method was used to collect data through distributing questionnaires. The distribution is done through online survey by using free online surveys, (kwiksurveys and my3q link).

The population which is chosen to be the object of this research is that users of e-money product in Indonesia. Sample selection is done by using purposive sampling method, because individual samples are only the users who had used the Flazz card for making transaction at all merchants over Indonesia.

The number of respondents whose have contacted as many as 371 respondents to anticipate the questionnaires which are not returned. The numbers of respondents and questionnaires that can be analyzed are

117 respondents. This research uses analysis tool of Structural Equation Modeling (SEM) with Partial Least Square software.

validity (with convergent validity and discriminant validity), and (2) internal consistency (reliability measurement with composite reliability). To examine the measurement model of indicator on reflective construct is done by algorithm process through outer loading value. The output of initial outer model can be seen in table 1 below.

5. Results

5.1. Outer Model: Validity and Reliability Testing

The measurement model of indicator on reflective construct had been examined by testing: (1) construct

Table 1. Initial Outer Model (Convergent Validity, Discriminant Validity and Reliability)

Indicators	PARTICIPATION	SATISFACTION	SYSTEM QUAL	TRUST	AVE	COMPOSITE RELIABILITY
KC1	0,308949	0,276811	0,351002	0,627204		
KC2	0,455000	0,421067	0,514727	0,787853		
KC3	0,105118	0,336615	0,443911	0,739275	0,511149	0,838254
KC4	0,239671	0,519003	0,523647	0,767175		
KC5	0,274186	0,264924	0,396160	0,637623		
KP1	0,290130	0,645712	0,420863	0,342231		
KP2	0,301898	0,688246	0,404262	0,371757		
KP3	0,351886	0,793392	0,463586	0,438531	0,415227	0,826339
KP4	0,206634	0,740163	0,447640	0,352221		
KP5	0,226701	0,671594	0,319963	0,262951		
KP6	0,253895	0,489323	0,284041	0,303860		
KP7	0,059283	0,384937	0,172780	0,240042		
KS1	0,307952	0,357138	0,657166	0,448559		
KS2	0,139622	0,304940	0,743459	0,520984		
KS3	0,196324	0,427579	0,798482	0,466637	0,527876	0,847510
KS4	0,197078	0,553796	0,760019	0,499024		
KS5	0,333671	0,435355	0,663007	0,346429		
PS1	0,761264	0,282862	0,134365	0,295150		
PS2	0,742782	0,197933	0,160571	0,195163		
PS3	0,716161	0,176235	0,180634	0,223677	0,547977	0,857079
PS4	0,849045	0,359582	0,354203	0,389512		
PS5	0,612267	0,354448	0,262889	0,312331		

Source: Support Data PLS (2014)

The indicators will be stated as valid if the value of outer loading more than 0.70. but, for loading 0.50-0.70 still can be accepted as long as the value of AVE and communality more than 0.50⁵⁵. 22 initial indicators had been proposed, but not all of them meet the rule of thumb for measurement indicator model.

Two indicators of satisfaction are being dropped, because their loading value and AVE show below 0,5. Then, the author re-run 20 indicators remaining. Table 2 shows outer model revision after two indicators (KP6 and KP7) had been deleted.

Table 2. Outer Model Revision (Convergent Validity, Discriminant Validity and Reliability)

Indicators	PARTICIPATION	SATISFACTION	SYSTEM QUAL	TRUST	AVE	COMPOSITE RELIABILITY
KC1	0,309184	0,249359	0,351132	0,627135		
KC2	0,455298	0,424254	0,514755	0,787744		
KC3	0,105234	0,285912	0,444522	0,739372	0,511161	0,838259
KC4	0,240514	0,492507	0,524389	0,767351		
KC5	0,274846	0,253938	0,395971	0,637547		

KP1	0,291061	0,708696	0,421128	0,342249		
KP2	0,302597	0,730708	0,404398	0,371788		
KP3	0,352344	0,789063	0,463128	0,438556	0,529350	0,848529
KP4	0,206826	0,749546	0,447731	0,352242		
KP5	0,226790	0,652786	0,319469	0,262972		
KS1	0,308150	0,334127	0,654817	0,448534		
KS2	0,139255	0,310976	0,745210	0,520979		
KS3	0,196500	0,418873	0,798849	0,466675	0,527842	0,847453
KS4	0,197731	0,554810	0,761485	0,499064		
KS5	0,333840	0,419397	0,661111	0,346404		
PS1	0,761542	0,277827	0,132847	0,295127		
PS2	0,740818	0,181823	0,159746	0,195114		
PS3	0,715491	0,166528	0,179443	0,223585	0,547622	0,856910
PS4	0,849295	0,347809	0,352855	0,389463		
PS5	0,613287	0,346008	0,262607	0,312276		

Source: Support Data PLS (2014)

Table 2 above shows that all of the indicators meet the criteria of validity. Beside validity test, all of the indicators also should be tested by reliability test. Reliability value can be seen in table 2 above from the value of composite reliability which greater than 0,70. Rule of thumb value for composite reliability must be greater than 0.7, but 0.6 though still acceptable⁵⁶.

The discriminant validity is not only can be tested from the loading value, but also can be seen by comparing the root of AVE (Square Root of Average) of a construct which must be higher than the correlation between latent variables. Table 3 below shows discriminant validity of this study.

Table 3. Discriminant Validity: Latent Variable Correlations

	PARTICIPATION	SATISFACTION	SYSTEM QUAL	TRUST
PARTICIPATION	0,740015			
SATISFACTION	0,383578	0,727564		
SYSTEM QUAL	0,315736	0,570070	0,726528	
TRUST	0,406212	0,492468	0,631959	0,714955

Source: Support Data PLS (2014)

Inner model: structural model testing

Structural model testing includes estimating the path coefficients that identify the strengths of relationship between dependent variable and independent variable.

Structural model testing generates significant value of path relationship among latent variables by using bootstrapping function⁵⁷. Table 4 below shows hypothesis testing for this study.

Table 4. Inner model (Hypothesis Testing)

HYPOTHESIS	Original Sample (O)	T Statistics (O/STERR)
TRUST → SYSTEM QUAL	0,631959	10,684574*
TRUST → PARTICIPATION	0,406212	6,298429*
SYSTEM QUAL → SATISFACTION	0,498673	7,355675*
PARTICIPATION → SATISFACTION	0,226129	3,043623*

*) Significant at α 0,05 (T-value greater than 1,96)

Source: Support Data PLS (2014)

The result of hypothesis 1a testing shows that trust has positive and significant influence on system quality. This is indicated by coefficient value of trust -> system qual is 0,631959 and t value of 10,684574. This finding answers the first research objective which examines the influence of trust on system quality. Hypothesis 1a is supported, because trust has positive influence on system quality with 95% confidence level.

The result of hypothesis 1b testing shows that trust has positive influence toward user participation. It indicated by coefficient value of trust -> participation is 0,406212 and t value of 6,298429. This finding answers the second research objective which examines the influence of trust toward user participation. Hypothesis 1b is supported, because trust has positive influence on user participation with 95% confidence level.

The result of hypothesis 2a testing shows that system quality has positive influence toward user satisfaction. This is indicated by coefficient value of system qual -> satisfaction is 0,498673 and t value of 7,355675. This finding answers the third research objective which examines the influence of system quality toward user satisfaction. Hypothesis 2a is supported, because system quality has positive influence on user satisfaction and significant at 95% confidence level.

The result of hypothesis 2b testing shows that user participation has positive influence toward user satisfaction. This is indicated by coefficient value of participation -> satisfaction is 0,226129 and t value of 3,043623. This finding answers the fourth research objective which examines the influence of user participation toward user satisfaction. Hypothesis 2b is supported, because user participation has positive influence on user satisfaction and significant at 95% confidence level.

6. Discussion

6.1 Findings Related to Hypothesis 1a

The effect of trust on system quality

Human brain activity's system has linkage to the trust. Brain activity of E-money card users to believe will stimulate cognitive process through neural prefrontal cortex. Thus, it influences users' assessment toward product they used. Brain activity system's theory which is proposed then may underlie the results of hypothesis testing in contextual phenomenon.

The test results in descriptions of first hypothesis, related to the influence of trust toward information's attribute associated with e-money product's context on the smart card in Indonesia, then E-money card users' trust toward vendor, merchant, and technology that support it will encourage the users to provide good quality rating toward system quality.

6.2 Findings Related to Hypothesis 1b

The effect of trust on participation

Social exchange theory³⁷ stated that human does an exchange relationship on the basis of trust. E-money card users who have high trust toward vendors will be willing to increase the number of transaction. This condition encourages users also be willing to do top up (recharge) for their cards in great amount even routine. When a user find a complaint in conducting transaction with E-money card, this user also will utilize Halo BCA service because this user believes that the transaction

problem can be solved quickly and responded well by the officers. Users believe, BCA has provided both good knowledge and skill to the officers.

6.3 Findings Related to Hypothesis 2a

The effect of participation on satisfaction

Users participation through evaluating cost efficiency and time of transaction was increased thus increasing satisfaction. This efficiency comes from the perceived ease of users toward system that makes the system considered more qualified and may increase satisfaction when using this system.

Time efficiency is obtained when users feel the speed and practicality of transaction rather than using both debit and credit cards that require the input of PIN and signature as authorization form. User perceived cost efficiency when E-money card transaction system does not burden the users with many rules in processing procedure, no tax deduction, spared from the problem of counterfeit money and fraudulent refund that are often not properly up to cost advantage of special discount from certain merchant for E-money card users.

6.4 Findings Related to Hypothesis 2b

The effect of system quality on satisfaction

Users which perform an increasing number of transaction and regular top-up show that they are satisfied with E-money card caused of efficiency and ease of use offered. Related to social exchange theory, user participation is initially influenced by trust through cognitive and affective stimulant resulted in the emergence of positive decision to participate using E-money card product. The depth of user involvement toward product reflects user satisfaction toward product. E-money card user which is increasing the number of transaction and top up caused of both discount and promo which was provided by merchant reflects user satisfaction because of the cost will be lower.

7. Conclusion

Evidently, trust was not a major concern in the context of smart card. Cognitive stimuli and emotional that affect human brain activity's system to have trust in the decision or give assessment of things are not entirely encouraging satisfaction on Flazz BCA card users. There are other factors that become stimulants for the fulfillment of Flazz BCA card users' satisfaction, which focus on system quality and participation of users. High level of trust when followed by system quality and

participation was also a stimulant for being high level of users' satisfaction.

The results of this study are expected to provide the theoretical implications of the linkage between trust and satisfaction of smart card users, especially on e-money products. Participation as an additional construct which elaborated the theory of human brain activity system by Dimoka¹⁶ has contributed in shaping the perspective that the function of satisfaction is not only built by the trust, but also by association with other variables such as system quality, participation, and user participation.

Concept from Dimoka¹⁶ associated with human brain activity system refers to the perspective of trust and distrust as two distinct constructs that emerge simultaneously. Trust and distrust that has a value in a certain range will appear simultaneously as a pendulum. Low levels of trust not indicate a high level of distrust. A high or low level of trust indicates the level of system quality and user participation. The lack of accuracy in determining the point that indicates the level of trust and distrust will affect the level of user satisfaction. Thus, accuracy in assessing the level of trust becomes important in the level of user satisfaction.

The results of this study in addition to providing theoretical implications are also expected to provide practical implications. Practically, when dealing with

the positive response, trust on merchant (bank) can be increased through management system and good information about the utilization of Flazz. Bank need to improve the system reports the remaining balance which is often not accurate to use a more accurate system for detecting miscalculation when making a transaction.

The quality system also needs to be improved related to the policy of innovation technology systems that are used in order to offer the ease of use and practicality of the product. Bank also need to provide reports and information that is precise, correct, clear, and the latest on the merchant's promos and discounts that attract users to top up which in turn increases the number of transactions. Negative effect on the quality of service user satisfaction can also be a reference for vendors to improve the performance of personnel providing services. Bank need to improve skills through training, reward those who perform good service to users, and the provision of punishment for officials who tend to neglect in response to user complaints. Generally, the results of this study are expected to provide input for the banking sector as a provider of e-money products in predicting the level of user satisfaction.

APPENDIX

Variables	Indicators	References
Trust	KC1 = Security	23, 58, 59, 60
	KC2 = Relevancy	
	KC3 = Overall Efficiency	
	KC4 = Problem Solving	
	KC5 = Ability	
Satisfaction	KP1 = Incentives	23, 61, 62, 63
	KP2 = Requirements	
	KP3 = Inventory Efficiency	
	KP4 = Time Efficiency	
	KP5 = Cost Efficiency	
	*KP6 = Certainty	
	*KP7 = Accuracy	
System Quality	KS1 = Operational problem	64, 65, 66, 67, 68
	KS2 = Procedural time efficiency	
	KS3 = Quick verification	
	KS4 = Practicability	
	KS5 = Ease of use	
Participation	PS1 = Quality	37, 51, 69, 70
	PS2 = Quantity	
	PS3 = Complaint	
	PS4 = Recommendation	
	PS5 = Supporting involvement	

*) KP6 and KP7 has been deleted on bootstrapping process

Source: Previous Studies

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