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THE IMPACT OF ELECTRONIC MONEY BALANCE TOP UP FEATURE ON SMARTPHONE IN TRANSACTIONS ON PUBLIC SATISFACTION USING TAM

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ABSTRACT

The purpose of this research was to identify and analyze public interest in the transaction process using Near Field Communication (NFC) in people who often use public transportation in performing their daily activities. This research focused on the NFC feature that was used for transactions using electronic money. The design method used in this research is descriptive associative which questions the relationship between two or more variables because the model used in this research is the Technology Acceptance Model which refers to the explanation of the main factors from user behavior towards user acceptance of NFC technology. The analysis was conducted on people regarding their daily activities in performing transactions using electronic money. The results achieved are data that can be seen from the people's interests and needs towards smartphones with NFC features gathered from the responses given by the people. The conclusion is that the data from this research can help existing smartphone producers to implement NFC features on affordable smartphones for the public.

Keywords: *NFC, Information Systems, Smartphone, Technology Acceptance Model (TAM)*

1. INTRODUCTION

Near Field Communication (NFC) is a short-range wireless communication technology. At present, the NFC function has been implemented in smartphones, which are used to meet various needs for performing the process of top-up or checking the balance of electronic money through the NFC function. In addition to payment needs, NFC also has other functions, those are access control, consumer electronic products, the world of health, information collection and exchange facilities, coupons and loyalty, transportation [1]. For the discussion of NFC features in this research, the researcher will focus on the use of NFC for electronic money for top-up and checking electronic money balances.

However, the adoption of payments such as electronic money is still not ideal compared to traditional payment methods [2]. As a result, many smartphone manufacturers do not install NFC technology on the smartphone products they distribute to Indonesia. Hence, the NFC feature is not commonly used by the people of Jakarta because smartphones marketed in Indonesia rarely have support for the NFC feature, or smartphones that support the NFC feature have prices that are less affordable for the people of Jakarta in general. So, for the use of Electronic Money, people prefer to top-up in minimarkets that provide Electronic Money services because their smartphones generally do not support the NFC feature. The use of Electronic Money can be more efficient and can be done anywhere if the people of Jakarta have the convenience of having and accessing the NFC feature. In this research the researcher uses the TAM model from [3], the following model image is shown in Figure 1:

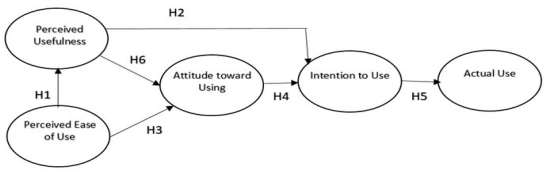


Figure 1 Model TAM from Davis, 1989

In the research reference study, the references that the researcher takes are the journal with the title "Penerapan Model TAM untuk Menilai Tingkat Penerimaan Nelayan terhadap Penggunaan GPS" by

[4], and the journal with the title "Kepercayaan Dan Penerimaan Layanan Mobile Money T-Cash Di Bandung Dengan Pendekatan Technology Acceptance Model (TAM)" by [5]. Tasmil & Herman's research discusses the problem of the level of acceptance of GPS technology by fishermen in Bulukumba Regency, for the results of the research prove that the level of acceptance by fisherman's in the use of GPS has a positive effect on fishermen by using variables from TAM which include the variable of Actual Use. Juhri & Dewi's research, discussing the issue of acceptance and trust by users on mobile money t-cash services in Bandung, results from the research proved that trust and acceptance proved to have a positive impact on Trust and had an influence on the variables: Perception of Usefulness, Perceived Ease of Use, Attitude Towards Using, and Intention to use. This research focused on the top-up and checking of electronic money balances using the NFC feature on smartphones and the subjects of this research are people who use electronic money who live in Jakarta.

The formulation of the problem is to look at the needs of people who need features for top-up electronic money balances, determine the target market for smartphone specifications today, determine the economic class of people who use electronic money, discover people's knowledge in the use of electronic money for the feature of top-up electronic money balances on NFC.

The purpose of the research was to measure the level of use of electronic money top-up by the people, the level of people satisfaction with the use of the electronic money top-up feature in smartphones, to determine the success rate of using the electronic money top-up feature in simplify on-site payment transactions, to determine the public's understanding of the NFC feature, find out the level of the economic class of people who on average use the electronic money top-up feature.

2. RESEARCH METHOD

The data collection method used in this research are literature study and online questionnaire. The literature study was conducted to obtain the research objectives and theoretical basis that can be used to solve the problems in this research using new reference sources related to the research topic. In conducting a literature study, the researcher uses research journals, books, available printed media on the internet, and other data sources available as printed media and media on the internet as references. In addition, this research also uses an online questionnaire to collect data directly from people to obtain information according to factual conditions and use the data for processing using SmartPLS to test the validity and reliability of this research.

In the preparation process of the online questionnaire, the researcher determined the minimum number of samples required for this research. This research uses purposive sampling where the researcher or writer can determine the characteristics of interest or requirements needed from individuals who will be the source of research data. Therefore, this research determines the criteria, those are people who live in Jakarta, using smartphones, and using electronic money. In determining the sample size, the research uses a sample-to-variable ratio of 15:1, which means that each variable requires at least 15 observations or samples, hence that this research requires a minimum of 75 observations or samples for 5 variables. Then the questions are arranged based on research needs using indicators that will be tested and are distributed using Google Forms through various social media such as Instagram, Facebook, Discord, WhatsApp, and Line.

This research uses the quantitative research method with the associative descriptive method. According to [6], quantitative research is research that is used to examine a population or sample, the data is then collected using instruments and the findings can be obtained using statistical or quantification procedures. Based on Sugiyono's theory, descriptive research methods are used with the aim to get the values of independent variables, whether it's only 1 variable or more (stand-alone/independent) that are not compared or related to other variables [7]. Descriptive research provides an overview of the studied population without manipulation and is used on the research independent variable, which is Perceived Ease of Use (PEOU). While research with the associative method has the aim of finding the effect or causal relationship of 2 or more variables between the independent variable and the dependent variable. This method is used on the dependent variable, specifically Perceived Usefulness (PU), Attitude toward Using (ATU), Intention to Use (ITU), and Actual Use (AU).

3. RESULTS AND DISCUSSION

Respondents from this research are people who live in Jakarta, use smartphones, and have electronic money. In data collection, as many as 106 questionnaires have been distributed with the data collection technique that is purposive sampling, then

from the results of the questionnaires distributed, as many as 94.3% of respondents met the requirements in the test for this research. Below are the demographics of the respondents in the research, as shown in Table 1:

Table 1 Demographics of respondents

Questionnaire	Frequency	Percentage
Age		
< 25 years (Post Millenials)	90	84.9%
26 - 40 years (Generation Y)	14	13.2%
41 - 56 years (Generation X)	2	1.9%
57 - 74 years (Baby Boomers)	0	0%
> 75 years (Matures)	0	0%
Money that can be spent for smartphones with NFC features		
< Rp 2.000.000	20	18.9%
> Rp. 2.000.000 - Rp 3.500.000	32	30.2%
> Rp. 3.500.000 - Rp 5.000.000	27	25.5%
> Rp 5.000.000	27	25.5%
A person who lives in Jakarta, uses a smartphone and has electronic money		
Yes	100	94.3%
No	6	5.7%

From the tests performed, there are validity and reliability tests. In the validity test, it can be said to be valid if the Outer loading value (the value of the respondent's level of understanding of the questionnaire) is above 0,6 [8]. The following results of the outer loading validity test data using smartPLS are shown in Table 2.

Table 2 Outer Loading Validity Test

	Actual Use	Attitude Toward Using	Intention to Use	Perceived Ease of Use	Perceived Usefulness
ATU1		0.853			
ATU2		0.873			
ATU3		0.852			
AU1	0.937				
AU2	0.958				
ITU1			0.742		
ITU2			0.883		
ITU3			0.857		
PEOU1				0.806	
PEOU2				0.858	
PEOU3				0.796	
PU1					0.869
PU2					0.811
PU3					0.865

Based on the data from table 2, it can be seen that the indicator with the smallest outer loading value in this research is the ITU1 indicator with a value of 0,742 and refers to [8], the indicator still reaches the standard, so the indicators used in this research are valid or has reached convergent validity because it is still above the value of 0,6.

In testing the validity, cross-loading calculations are also needed which are used to check if the correlation value of the variable to the indicator in the existing model has the best value than the value of the variable to other indicators or vice versa. So, if the value of the variable to the indicator itself is the highest, then the loading value in this research can be said to be good and no lag occurs. The results of the following cross-loading validity test data using smartPLS are shown in Table 3.

Table 3 Cross-loading Validity Test

	Actual Use	Attitude Toward Using	Intention to Use	Perceived Ease of Use	Perceived Usefulness
ATU1	0.251	**0.853**	0.483	0.629	0.731
ATU2	0.333	**0.873**	0.465	0.671	0.618
ATU3	0.288	**0.852**	0.431	0.661	0.622
AU1	**0.937**	0.328	0.509	0.366	0.280

	Actual Use	Attitude Toward Using	Intention to Use	Perceived Ease of Use	Perceived Usefulness
AU2	**0.958**	0.313	0.623	0.315	0.273
ITU1	0.492	0.325	**0.742**	0.388	0.265
ITU2	0.552	0.447	**0.883**	0.492	0.341
ITU3	0.459	0.545	**0.857**	0.538	0.429
PEOU1	0.411	0.589	0.573	**0.806**	0.529
PEOU2	0.250	0.715	0.402	**0.858**	0.604
PEOU3	0.225	0.552	0.452	**0.796**	0.544
PU1	0.225	0.638	0.364	0.621	**0.869**
PU2	0.194	0.641	0.311	0.516	**0.811**
PU3	0.316	0.672	0.391	0.598	**0.865**

According to Table 3, it can be seen that the Cross Loading value indicates that there is no lag in the test value between the indicator and the variable according to [9]. Because there is no greater value than the comparison between the indicator and the variable itself. So, this research can be said to be valid and the researcher can proceed to the reliability test.

Reliability tests were carried out in the research to determine whether the instrument from the questionnaire gave the correct results so that the truth could be explained. The following results of reliability test data and Cronbach's Alpha using smartPLS are shown in Table 4.

Table 4 Reliability Test and Cronbach's Alpha

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Actual Use	0.888	0.914	0.946	0.898
Attitude Toward Using	0.823	0.824	0.895	0.739
Intention to Use	0.771	0.784	0.868	0.688
Perceived Ease of Use	0.757	0.767	0.860	0.673
Perceived Usefulness	0.805	0.809	0.885	0.720

In table 4, it can be seen that there is no Cronbach's Alpha value below 0,6 according to [10], Cronbach's Alpha value can be said to be reliable and acceptable if it has a minimum value of 0,6. From the research results, the variable with the lowest value still meets the minimum standard in the Perceived Ease of Use, with a value of 0,757. The Average Variance Extracted test also shows a good value because the minimum standard of the AVE value is 0,5 while in this research the lowest value of AVE is in the Perceived Ease of Use variable with a value of 0,673.

After testing the validity and reliability of this research, a hypothesis test will be carried out to see if the indications are significant for the relationship between the variables in this research based on the value of the Path Coefficient to determine that the value of the relationship between the variables in this research has a positive/negative effect on society with a value of + 1 if it has a positive effect and the value of the T-statistic to see the level of significance in the relationship of each variable in this research model with a value above 1,96 if it has a significant effect. The following are the results of the hypothesis test values in Table 5.

Table 5 Hypothesis Test

Hypothesis	Relationship	Original Sample (O)	T-Statistics	Conclusion
H_1	Perceived Ease of Use (PEOU) -> Perceived Usefulness (PU)	0.683	3.757	Significant
H_2	Perceived Usefulness (PU) -> Intention to Use (ITU)	0.024	0.154	Not Significant
H_3	Perceived Ease of Use (PEOU) -> Attitude toward Using (ATU)	0.443	4.031	Significant
H_4	Attitude toward using (ATU) -> Intention to Use (ITU)	0.517	3.120	Significant
H_5	Intention to Use (ITU) -> Actual Use (AU)	0.603	5.592	Significant
H_6	Perceived	0.464	5.352	Significant

Hypothesis	Relationship	Original Sample (O)	T-Statistics	Conclusion
	Usefulness (PU) -> Attitude Toward Using (ATU)			

On table 5 Hypothesis Test, there is a conclusion that Hypothesis H_1: Perceived Ease of Use (PEOU) has a significant impact on Perceived Usefulness (PU). It is concluded that the path coefficients and T-statistics are higher than the minimum values, that is 0,684 and 4,536, suggesting that the convenience gained from the NFC function has an impact on people's perception of usability.

Hypothesis H_2: Perceived Usefulness (PU) has a positive, but not significant effect on Intention to Use (ITU). It is concluded that the Path Coefficient and T-statistics values are below the minimum values, that is 0.031 and 0.212, which indicate that the perception of the usefulness of the NFC feature does not have a major influence on people's usage behavior.

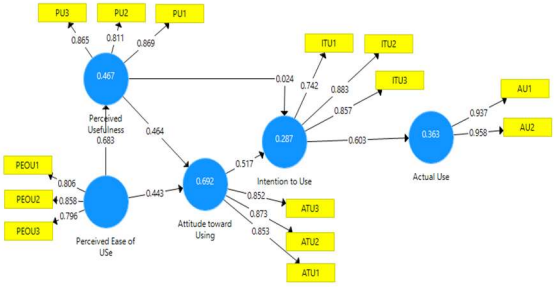
H_3: Perceived Ease of Use (PEOU) has a significant effect on Attitude toward Using (ATU). It is concluded that the path coefficients and T-statistics are above the minimum values, that is 0.760 and 5.970, suggesting that the convenience gained from the NFC feature has an impact on the attitude of use from people.

H_4: Attitude toward Using (ATU) has a significant effect on Intention to Use (ITU). It is concluded that the Path Coefficient and T-statistics values are above the minimum values, namely 0.511 and 2.897, indicating that the attitude of using the NFC feature has a significant effect on user behavior in society.

H_5: Intent to use (ITU) has a significant impact on actual use (AU). It is concluded that the Path Coefficient and T-statistics values are above the minimum values, that is 0.603 and 6.366, indicating that the behavior of using the NFC feature has an influence on people's actual use.

H_6: Perceived Usefulness (PU) has a significant effect on Attitude Toward Using (ATU). It is concluded that the Path Coefficient and T-statistics values are above the minimum values, that is 0.464 and 5.352 which indicate that the perception of the usefulness for the NFC feature has an influence on people's attitudes in using existing technological features.

Based on the results of hypothesis testing that has been developed from [5] & [4]. Referring to the hypothesis based on the TAM model [3] related to the hypothesis H_1, H_3, H_4, H_5, H_6 and [11] for the H_2 hypothesis, it can be concluded that the effect of the feature for electronic money balances top-up on smartphones in transactions for satisfaction people has a significant influence. Because if it is seen that almost all of the tested hypotheses have a positive and significant effect, only the H_2 hypothesis has a positive but not significant effect in this research. There is also a picture of the path modeling used in this research, as shown in Figure 2.



Figures 2 Path Modeling

In this research, it can be said that the effect of the electronic money balance top-up feature on smartphones for transactions on public satisfaction has a significant positive effect on the transaction methods used by people because based on the perceived ease of use variable, with the NFC feature, people can easily access their electronic money information using smartphones. This saves the time needed to check/top up e-money balances at the nearest mini-market.

4. CONCLUSION AND SUGGESTION

It can be concluded, based on the results of the questionnaire data, it is known that the majority of people are interested and able to accept NFC technology. Based on the questionnaire data received, people are able to use NFC so that it can simplify their daily activities and will continue to use electronic money in the long term because it can provide practical benefits.

Based on the hypothesis analysis of the relationship between Perceived Ease of Use and Perceived Usefulness, it is known that the ease of using technology (in this research, NFC) can affect their perception of the technology which will increase the use-value of the technology. However, based on the relationship between Perceived Usefulness and Intention To Use, even though the

technology has a use-value if for one's it is not needed in daily activities/urgent needs, the Intention To Use it will be lower. In the relationship between Perceived Usefulness and Attitude Toward Using, it is stated that the perception of the usefulness of the technological features that will be applied has an influence on the people's attitudes of use. In addition, the relationship between Attitude Toward Using has a significant effect on Intention to Use, indicating that intention is also influenced by a person's positive attitude towards the technology. Finally, based on the relationship between Intention to Use and Actual Use, intentions affect a person's interest in implementing the technology in their daily activities.

Based on the benefits, this research can provide useful information related to the acceptance of technology and people's need for electronic money and NFC which is expected to be a reference for various parties as well. Information from this research can be used as a public technology facility development.

Therefore, the results obtained in this research are that the majority of people are interested and able to accept NFC because it makes their daily activities easier. People are interested in using this technology in long term. People are willing to spend a budget to be able to implement NFC on their smartphones. However, not many smartphones with this price range have the NFC feature implemented in their smartphones. Based on the research, it can be seen what factors influence a person's acceptance of technology and how these factors influence each other.

The limition of this study is the respondents only come from one city in Indonesia, Jakarta, so that generalizations cannot be made to a larger scope. Suggestions that can be given from this research are the research data can help other researchers as a reference related to the public interest in the NFC feature. This research can be a reference that the higher the public interest in the NFC feature, the higher the consideration of smartphone manufacturers for implementing this feature in the future so that manufacturers know the target market for this feature. The contribution of this research is to provide strategies to related companies to increase the competitiveness of the products produced by the company. NFC provides new potentials for capacity enhancement and accessibility improvement [12].

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