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Analysis of User Acceptance Factors of the QR Code as a Payment System in Mobile Banking using the Utaut Method: Simobiplus Mobile Banking

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Abstract: ***In an increasingly modern era of globalization, people and technology are now starting to coexist, technology is always associated with various fields and activities of human activities with the aim of helping the work process to achieve maximum results, one area of business that feels its development is the Banking sector. Previously, services were traditionally provided through branch offices, but now banking services have begun to be done digitally using the Mobile Banking service so that transactions can be done anytime, anywhere. The banking industry is now competing to provide better transaction services, one of which is by providing QR Code transaction services on mobile banking, QR Code Transactions are payment methods that are run using QR Codes that are read using a Scanner through the Mobile banking application. Sinarmas Bank is one of the banks that provides QR Code transaction services for its customers. However, since the QR Code service was launched to customers, transactions have not grown significantly and have not been in line with the company's business goals. The methodology that will be used in this study is the modified UTAUT method, with this method it is expected to know what factors influence the acceptance of the QR Code payment system, research data obtained from the questionnaire, then the data will be processed with the PLS SMART application. From the results of data processing it is known that Performance Expectancy (PE), Expectancy expectation (EF), Perceived Trust (PT), Social influence (SI), moderation 1 (EF-EX) significantly influence Behavior Intention (BI) and Behavior Intention (BI)) and Facilitating Conditions (FC) affect Use Behavior (UB). From the results of the data processing, Sinarmas Bank can further develop focused on variables that significantly influence the acceptance of QR Code services so that the services provided are better.***

Keywords: Mobile Banking, QR Code, UTAUT, Variabel perceived Trust, Perbankan , SMART PLS.

I. INTRODUCTION

In this increasingly modern era of globalization, now humans and technology have begun to coexist, Technology is always there for various fields and activities of human activities with a view to helping the work process in order to achieve more optimal results. productive and efficient in various businesses (Davis et al., 1989), One of the businesses that feels the impact of technology is the banking sector. The impact of technology in the existing banking sector is the change in services provided, long ago all banking institutions served customers traditionally through branch offices to conduct various transactions, opening an account, opening a savings account, depositing and applying for credit, but now almost all banking institutions are beginning to change the way they serve digital services, now almost all activities in branches can be carried out digitally, anytime and anywhere so that customers no longer need to come to the branch office to conduct various transactions, now it can be done using a technology called Mobile Banking. Mobile banking is a banking service that can be used by customers to carry out various daily transaction activities easily anytime and anywhere (Hanif Astika Kurniawati, Wahyu Agus Winarno, Alfi Arif, 2017), the presence of mobile banking in Indonesia is related to the growth of smartphone users which is growing every year. Seeing the growth of Smartphone users that is growing quite high each year, the banking industry is currently starting to focus on developing digital services, especially mobile banking, by providing a variety of features that can further facilitate customers making transactions, one of them is QR code transactions. QR Code payment is a payment method that works by using a barcode scanner in the mobile banking application and then the customer can direct the scanner towards the existing QR Code at the merchant. Sinarmas Bank is one of the banks that provides QR Code transaction services for customers. After launching for 1 year, the transaction growth has not been in line with the company's business targets, the transaction is currently showing a decrease every month compared to other payment methods such as Purchases

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(credit, data packages, emoney topup) and payment transactions (Telkom, credit cards, internet, Cable TV, etc.).

Seeing from these problems, in this study an analysis of QR Code services will be conducted in terms of user acceptance. Evaluation of QR Code services in this study will use the UTAUT method developed by (Venkatesh et al, 2003),.

II. THEORETICAL BACKGROUND

A. A. QR Code

QR Code is a two-dimensional barcode that was developed by denso wave, a company in Japan and began to be published in 1994 (M. Pasca Nugraha, Dr. Ir. Rinaldi Munir M.T, 2011). QR code means "Quick Response", the main purpose of this technology is to convey information quickly and get a fast response also from a scanner system that can read it (scanner). QR Code is able to store various data and information such as text, alphanumeric, starch, symbol, binary horizontally and vertically different from ordinary barcodes which can only store data in one dimension and the data is placed horizontally (Nugraha, Dr. Ir. Rinaldi Munir MT , 2011) How to use QR code when transacting is quite easy, users just simply open the application then access the QR Code scanner menu, after the scanner is open the user only needs to direct the scanner to the QR Code available at the merchant to make transactions.

B. Mobile Banking

Mobile banking is an electronic service provided by banks for its customers to be able to freely access banking services such as branch and ATM location information, product information, promotions and various transactions via smartphones, with mobile banking customers can make transactions anytime and anywhere without time constraints while still paying attention to security (Barnes & Corbitt, 2003).

C. The Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is one of the acceptance models used to conduct research guides, UTAUT is a model developed by Venkatesh and Morris and several other researchers. The UTAUT methodology is actually a combination of several other acceptance technology models consisting of 8 models regarding users, 8 models that are used as a reference for UTAUT are:

1. Theory Reasoned Action (TRA)
2. Theory Acceptance Model (TAM)
3. Motivational Model (MM)
4. Theory of Planned Behaviour (TPB)
5. Combined TAM and TPB
6. Model of PC Utilization (MPTU)
7. Innovation Diffusion Theory (IDT)
8. Social Cognitive Theory (SCT)

Based on research made by (Venkatesh et al., 2003) UTAUT consists of 4 main constructs namely performance expectations, effort expectations, social influence, and facilitation conditions in which the four constructs represent independent variables that indirectly affect other variables, namely behavior intention and usage behavior. In addition to the six variables, there were also four moderators who also influenced the main variables, namely gender, age, experience and volunteerism, which can be seen in Figure 1 regarding the following UTAUT model'.

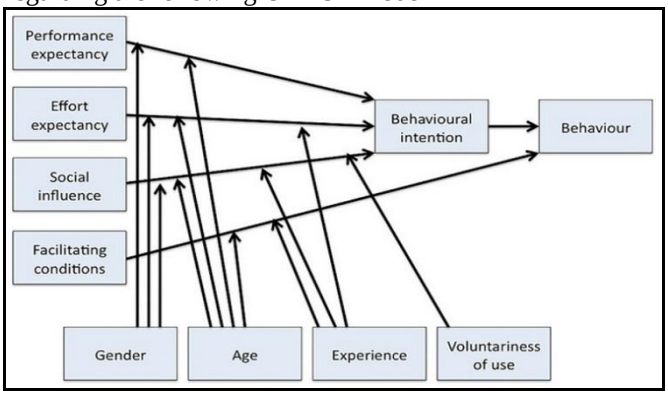

Figure 1 UTAUT Model

D. Perceived Trust

Perceived Trust is a very important factor and can influence users in using a technology (Irwan & Shinta Permata, 2014) the application of Perceived Trust in a digital-based service can be defined as user confidence in the application, that by using an application can meet their needs (Mukherjee & Nath, 2003). Trust is very much needed for consumer relations with digital service providers, because when user trust is low, it makes users less willing to use technology.

E. User Acceptance

User acceptance is a desire from each user to utilize Information Technology (Dillon, 2001). the number of users of a system that has been created determines the success of the system that has been created. To understand user acceptance, there are several research models that have been made to see the level of user acceptance, TAM model is one of them (Davis & Davis, 1989). But as time evolved, researchers began to find a new model called UTAUT where the model was tested to be more successful in determining user acceptance (Lee et al., 2003).

F. Mobile Banking SimobiPlus

Bank Sinarmas provides QR payment services, making it easier for customers to make transactions, this service makes customers no longer need to use cash when making transactions at various merchants, this QR payment service model can be run using the mobile application media owned by customers to transact (as a scanner) and applications used by merchants to record transactions.

III. RESEARCH METHODOLOGY

A. Research Model

The analysis in this study uses the UTAUT research model with the intention to see the relationship between variables related to the addition of variable trust to conduct analysis. The variable Then added because it was considered quite influential on user interest in using a banking service such as mobile banking and internet banking, in a previous study conducted by Kinzie

Vitalli discussing the evaluation of the use of the internet banking system and previous research conducted by Irwan Tirtana and Shinta Permata Sari (2014) regarding the effect of perception of trust on the use of mobile banking explained that variable trust is very influential on customer interest using a banking service.

variables that will be used in this study are:

1. Performance expectancy
2. Effort expectancy
3. Social influence
4. Facilitating conditions
5. Perceived Trust

In addition to these variables, there are moderating variables Age and usage time appliacation as depicted in Figure 2 regarding the research model modification of the UTAUT model.

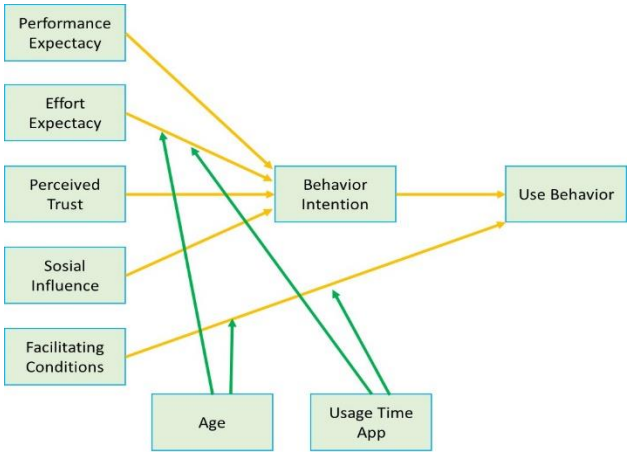

Figure 2 UTAUT Modified Research Model

B. Data Collection

The number of SimobiPlus Mobile banking users last position in June 2019 was 221,000, but in this study the authors only used the population of active SimobiPlus mobile banking users specifically in the DKI Jakarta region with a total of 47,000 Users, for this study the sample size that can represent the total number of mobile banking users in the Jakarta region is 397 users based on Slovin's calculations

C. Data Analysis

Data collection method is done by distributing questionnaires to get data and then it will be processed using the SMART PLS application. As for the questionnaire model that will be used is to use questions with a linkert scale for the measurement of the questionnaire value

IV. RESULTS AND DISCUSSION

A. Evaluasi Model Pengukuran (Outer Model)

1. Convergent Validity Test

Convergent Validity Test is conducted to test the indicators and variables. An indicator is declared valid if it has a loading factor > 0.7 against the latent variable (Santosa, 2018)

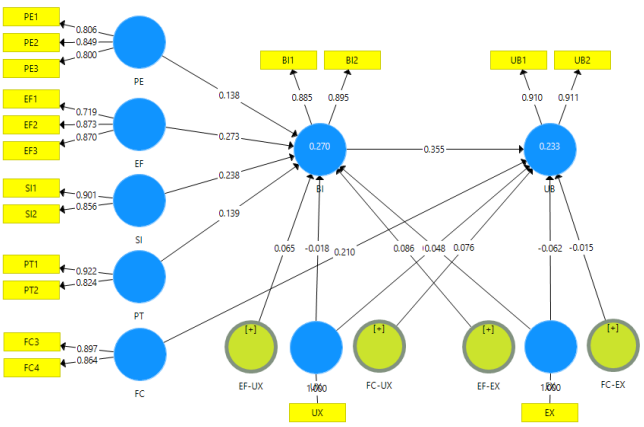

Figure 3 Value of loading factors

After testing, all indicators are declared valid because each indicator already has a loading factor value above> 0.7. As illustrated in Figure 3 regarding the value of loading factors, a detailed explanation is explained in Table 4.4 regarding the loading factor values, as follows :

Table 1 Value of loading factors 389 Respondents

Variable	Indicator	Loading Factor	Coefficient	Result
Performance Expectancy	PE1	0,839	0,700	Valid
	PE2	0,948	0,700	Valid
	PE3	0,896	0,700	Valid
Effort Expectancy	EF1	0,881	0,700	Valid
	EF2	0,921	0,700	Valid
	EF3	0,948	0,700	Valid
Social Influence	SI1	0,819	0,700	Valid
	SI2	0,899	0,700	Valid
Facilitating Conditions	FC3	0,841	0,700	Valid
	FC4	0,860	0,700	Valid
Use Behavior	UB1	0,933	0,700	Valid
	UB2	0,934	0,700	Valid
Behavior Intention	BI1	0,949	0,700	Valid
	BI2	0,940	0,700	valid
Perceived Trust	PT1	0,913	0,700	valid
	PT2	0,816	0,700	valid
Moderation 1	EF x UX	1,074	0,700	valid
	EF x EX	1,331	0,700	valid
Moderation 2	FC x UX	1,097	0,700	valid
	FC x EX	1,032	0,700	valid

2. Discriminant Validity Test

Discriminant test is run to see the value of Average Variance Extracted (AVE), a variable is classified as good if it has a value of AVE> 0.5. In table 2 regarding the AVE value, it can be seen that all variables used in this study have fulfilled the value of> 0.5

Table 2 AVE value of 389 respondents

Variable	Average Variance Extracted (AVE)
Performance Expectancy	0,670
Effort Expectancy	0,679
Social Influence	0,772
Facilitating Conditions	0,775
Use Behaviour	0,829
Behaviour Intention	0,792
Perceived Trust	0,764
Effort Expectancy x Age	1,000
Effort Expectancy x Experience	1,000
Facilitating Conditions x Age	1,000
Facilitating Conditions x Experience	1,000

3. Reliability Test

Reliability testing is aimed at the latent variable itself, testing is done by looking at the value of composite reliability, because a latent variable is declared valid if it has a Composite Reliability value> 0.7.

Table 3 Composite Reliability Value of 389 Respondents

Variable	Composite Reliability
Performance Expectancy	0,859
Effort Expectancy	0,863
Social Influence	0,871
Facilitating Conditions	0,873
Use Behaviour	0,906
Behaviour Intention	0,884
Perceived Trust	0,866
Effort Expectancy x Age	1,000
Effort Expectancy x Experience	1,000
Facilitating Conditions x Age	1,000
Facilitating Conditions x Experience	1,000

The table 3 explains the results of testing of 398 respondents to see the value of composite reliability. after testing all the variables are declared valid because the composite reliability value> 0.7 so that all variables are declared realible for use in further research

B. Evaluation of Structural Model (Inner Model)

Evaluation of the structural model (inner model) is carried out to see the relationship between the dependent variable and the independent variable. This evaluation is done by looking at the t-statistic and P-Value values, a variable will be declared to have a significant effect if the variable has a t-statistic value> 1.96 and P-Value <0.05 obtained from the Bootstrapping process using the SMART PLS application.

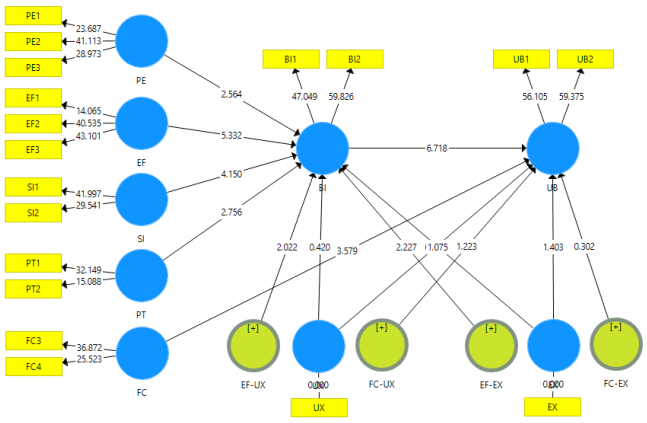

Figure 4 Bootstrapping Results

Figure 4 shows the results of the bootstrapping process that was performed using the SMART PLS application for 389 respondents, then explained in more detail about the t-statistic and p-value values for each relation.

Table 4 Path Coefficient Results

Relation	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Result
EF > BI	0,273	0,274	0,053	5,159	0,000	Accepted
PE > BI	0,138	0,141	0,056	2,469	0,014	Accepted
PT > BI	0,139	0,141	0,051	2,734	0,006	Accepted
SI > BI	0,238	0,238	0,058	4,109	0,000	Accepted
FC > UB	0,210	0,211	0,055	3,792	0,000	Accepted
BI > UB	0,355	0,354	0,051	6,992	0,000	Accepted
EF-EX > BI	0,086	0,085	0,041	2.090	0,037	Accepted
EF-UX > BI	0,065	0,069	0,034	1,920	0,050	Rejected
FC-EX > UB	-0,015	-0,015	0,050	0,294	0,769	Rejected
FC-UX > UB	0,076	0,072	0,060	1,263	0,207	Rejected

Based on table 4 on the path coefficient results obtained results are Performance Expectancy (PE), Effort expectancy (EF), Perceived Trust (PT), Social influence (SI), moderation 1 (EF-EX) significantly influence Behavior Intention (BI) and Behavior Intention (BI) and Facilitating Condition (FC) affect the Use Behavior (UB) because it has a T-static value greater than 1.96 and a P-Value less than 0.05. While moderation 1 (EF-UX) does not affect Behavior Intention (BI) and moderation 2 (FC-EX) and (FC-EX) does not affect Use Behavior (UB) because it does not meet the T-statistic and P-Value values

V. DISCUSSION

The problem underlying this study is that the growth of QR Code service transactions does not grow significantly and instead tends to decrease every month. From these problems, the authors provide the following recommendations

Table 5 Discussion

Hypothesis		Result	Discussion
H1	Performance Expectations have a significant effect on Behavior Intentions	Accepted	Upgrade system and QR Code feature to further facilitate and speed up customer transactions.
H2	Effort Expectacy has a significant influence on Behavior Intention	Accepted	Optimizing the appearance / interface of the application so that customers are easier to use
H2A	Effect of Effort Expectacy on Behavior Intention is moderated by Age	Rejected	Optimizing the appearance / interface of applications so that customers of all ages can more easily use it
H2B	Effect of Effort Expectacy on Behavior Intention is moderated by Use Time Application	Accepted	Providing guidelines for using the QR Code service interactively and detail so that customers are interested in reading so that new users can quickly learn the QR Code service
H3	Perceived Trust has a significant influence on Behavior Intention	Accepted	Improve the ability of the QR Code service, so that customers feel confident about Bank Sinarmas competence to providing QR Code services
H4	Social Influence has a significant influence on Behavior Intention	Accepted	Expand promos to attract customers using the QR Code payment service
H5	Facilitating Conditions have a significant effect on Use Behavior	Accepted	solve customer problems quickly or answer questions that enter the customer care team
H5A	Effect of Facilitating Conditions on Use Behavior is moderated by Age	Rejected	Provide information to customers about how to use the QR Code application, where the information provided is adjusted to the age of the customer
H5B	Effect of Facilitating Conditions on Use Behavior is moderated by the Use Time application	Ditolak	Provide information to customers about how to use the QR Code application, where the information provided is adjusted to the customer's experience
H6	Behavior Intention has a significant effect on Use Behavior	Accepted	increase customer interest in using the QR code payment application following the previous discussion so that customers can use the QR Code service continuously in the future

VI. CONCLUSION

Based on the results of research that has been conducted regarding the Analysis of Acceptance Factors of QR Code Payment Systems in Mobile Banking Using the UTAUT Method Case studies at Sinarmas Bank that have been processed using the SMART PLS application, the results obtained :

Result		
H1	Performance Expectancy of Behavioral Intention had a t-statistic value of 2.469 and a p-value of 0.014	This shows that the performance of the application will affect the customer's interest in using the QR Code transaction service, if the performance of the QR Code transaction service is better then it will accelerate and facilitate customer transactions
H2	Effort expectancy of Behavioral Intention had a t-statistic value of 5.159 and a p-value of 0,000	This showed that the ease of the customer in learning the QR Code transaction service affected the customer's interest in using the QR Code service
H2A	Effort expectancy of Behavioral Intention influenced by Age had a t-statistic value of 1,920 and a p-value of 0.050	This showed that the ease of the customer in learning the QR Code transaction services for the interest in using the QR Code transaction services was not influenced by age customers, because almost all users of the QR code service on the Simobiplus application have used transaction services similar to other applications
H2B	Effort expectancy of Behavioral Intention influenced by use time application has a t-statistic value of 2.090 and a p-value of 0.037	This shows that the ease of customers in learning services QR Code transactions regarding interest in using QR Code transaction services are influenced by the customer's experience in using the Simobiplus application. The more often customers use the SimobiPlus application, the more customers will get used to the application.
H3	Perceived Trust in Behavioral Intention had a t-statistic value of 2.734 and a p-value of 0.006	This shows that the customer's confidence in the ability of Bank Sinarmas in providing Simobiplus applications, specifically QR Code transactions, affects customer interest in using QR transaction services. Code
H4	Social influence on Behavioral Intention had a t-statistic value of 4.109 and a p-value of 0.000,	This shows that the influence of the environment around the customer and the promo made by Sinarmas Bank affect the customer's interest in using the QR Code transaction service. The more promos that are given will increasingly attract customers to use services coupled with the surrounding environment who also use the service
H5	Facilitating Conditions for Use Behavior had a t-statistic value of 3,792 and a p-value of 0,000	This indicated that there was support from Sinarmas Bank for QR Code services as provided. the customer care team and the provision of instructions for using the QR Code Payment transaction service affects customer behavior in using the QR Code transaction service
H5A	Facilitating Conditions of Use Behavior influenced by Age had a t-statistic value of 1.263 and a p-value of 0.207	This shows that the support provided by Bank Sinarmas in influencing user behavior is not affected by the age of the customer, because the support of Sinarmas Bank such as the existence of a customer care team and instructions for using the QR Code service can be used by all age customers.
H5B	Facilitating Conditions of Use Behavior influenced by Use Time Applications have a t-statistic value of 0.294 and a p-value of 0.769	This shows that the support provided by the Bank Sinarmas in influencing user behavior is not influenced by the customer's experience in using SimobiPlus application, because the support from Sinarmas Bank such as the customer care team and the instructions for using the QR Code service can be used by all customers, both new users and existing users.
H6	Behavior Intention of Use Behavior has a t-statistic value of 6.992 and a p-value of 0.000	This shows that the customer's intention to use the QR Code Transaction service has an impact on the use of services QR Code in the future

After knowing what factors are most influential on QR Code transactions, to improve service to customers, Sinarmas Bank can develop according to the research results so that service to customers can be even better and the growth of QR Code transactions can grow significantly.

REFERENCES

1. Davis, F. D., & Davis, B. F. D. (1989). Perceived Usefulness , Perceived Ease of Use , and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319–340.
2. Kurniawati, H. A., Winarno, W. A., Arif, A., Ekonomi, F., & Unej, U. J. (2017). Analisis Minat Penggunaan Mobile Banking Dengan Pendekatan Technology Acceptance Model (TAM) Yang Telah Dimodifikasi (Analysis Behavioral Intention to Uses of Mobile Banking Technology Acceptance Model (TAM) Approach Modified). IV(1), 24–29
3. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). U SER A CCEPTANCE OF I NFORMATION T ECHNOLOGY : T OWARD A U NIFIED V IEW 1. 27(3), 425–478
4. Nugraha, M. P., & Dr. Ir. Rinaldi Munir M.T. (2011). Pengembangan Aplikasi QR Code Generator dan QR Code Reader dari Data Berbentuk Image. Konferensi Nasional Informatika – KNIF 2011, ISSN: 2087-3328, 148–155
5. Barnes, S. J., & Corbitt, B. (2003). Mobile banking : concept and potential. 1(3)
6. Irwan, T., & Shinta Permata, S. (2014). Seminar nasional dan call for paper program studi akuntansi-feb ums, 25 juni 2014. 671–688

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