

# FACTORS AFFECTING INTERBANK ADOPTION (A CASE FROM LINK OF INDONESIA)

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*The Country of the 13<sup>th</sup> rank Internet users is Indonesia. This has an impact on the use of electronic services (e-channel) via the interbank network by the banking industry, particularly the relation with the use of link building services is still limited to customers of Mandiri Bank, BRI (Indonesia Republic Bank), BNI (Indonesia State Bank) and BTN (State Savings Bank) amount of 147 million transactions in 2013, or 14%. Therefore, there are several factors the use of interbank network services that are not yet understood in Indonesia that must be investigated, especially concerning the adoption of inter bank network services. Thus, the research can be known accurately by UTAUT2 Modified model of Venkatesh & Xu, 2012 concerning the consumer tendency to use information technology to the explanatory power through questionnaire data collection of 220 valid respondents, data processing with tools SmartPLS 3.0. so the behavior intention of interbank network services is predicted amounted to 74.2%. But the lowest approval level of security and privacy is Link, using the private network as a attention from Link to Users to be safe and secure their privacies.*

**Keywords:** Technology Adoption, Interbank Network Link, UTAUT2 Modified, Indonesia.

## 1. Introduction

Indonesia is the 4<sup>th</sup> most population total in the world's by largest number of 249, 8 million people. But from Indonesia's economic growth in 2014 reached 5.02%, slightly lower than in other developing countries such as Malaysia (5.5%) and slightly higher than Singapore (3.5%) and Thailand (3.7%) , even higher than the growth of the world economy (3.5%).

Indonesia's economic growth occurred in all economy sectors , the industrial of processing sector has the highest role in 2014 amounted to 21.02%, or a growth of 4.63%. The agricultural sector also increased by 15.8%, or a growth of 4.2%. Followed by the construction sector with 9.88% with a growth of 6.97% and mining 9.82% with a growth of 0.55%.

Although the US dollar exchange rate strengthened, Indonesian banks are still performing well because it has anticipated by strictly limitation of loans that denominated in US dollars. The banking industry growth of 7.5% continues to grow the business, supported by 120 banks consisting of several categories such as four state banks, 10 foreign banks, 35 foreign exchange banks, 30 joint venture banks, and 26 BPD (Indonesian Banking Statistics-vol.11, no.11, October 2013).

Based on the number of customers, BRI (Bank of Indonesia Republic) was ranked first ahead of BNI (Bank Of Indonesia State), BCA (Bank of Central Asia), BTN (State Saving Bank) , Danamon and BII CIMB Commerce and Permata Bank, so be a market leader in

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terms of number of customers. Total customer who has a savings account is derived from the Indonesian population aged over 15 years are 58 million people. However, when today's in era of digitalization, the Indonesian people begin to realize the utility and technology urgency. This proved Indonesia ranked 13th as the country's highest rates of Internet users after China, US, India, Japan, Brazil, Russia, Germany, Nigeria, UK, France, Mexico, and South Korea.

This high Internet users are used by the banking industry in Indonesia to increase the penetration of banking products and services (in terms of services access). It is supported by the demands of faster service, flexible with increasingly varied product that is reinforced with service interoperability between banks through the interbank system network.

Interbank network system facilitates financial transactions of customers, by utilizing electronic channel or e-channel. Electronic banking services include ATM machines, EDC, mobile banking, internet banking and SMS banking. Ease of it due to changes in lifestyle, the cost of transactions in the branch which is more expensive for banks than e-channel as well as improve efficiency. On the other hand, the service, provides new revenue through service charges or fee-based income, expand the range and increase the number of new customers.

Thus, it is proved in the report of payment system and money management 2012 Indonesia Bank, banking transactions during 2012 reached Rp. 104.83 thousand trillion with a transaction volume amounted to 3.27 billion, of which 82% or 2.7 billion transactions by e-channel. On the other hand, the Link transaction is still lower than total of e-channel transaction in Indonesia.

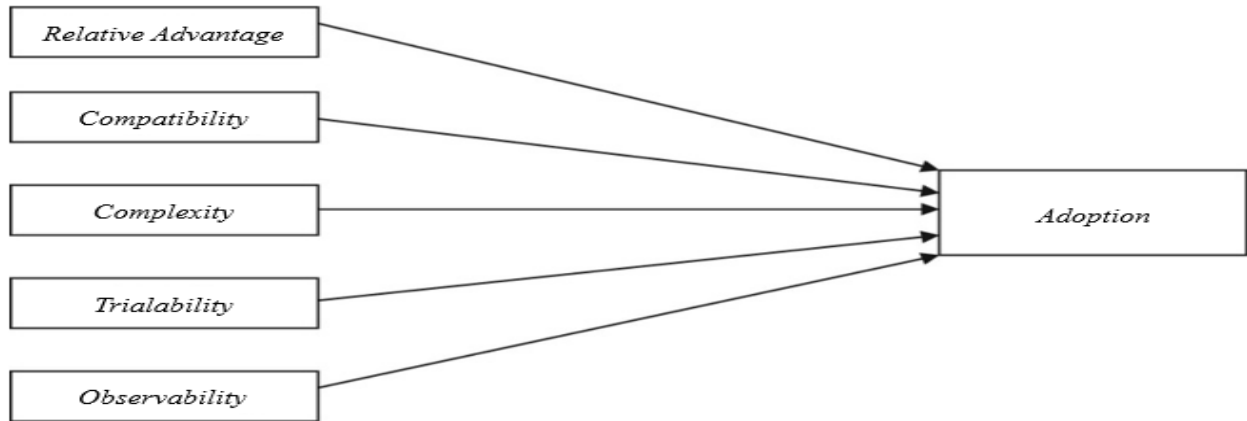
## **2. Literature Review**

### **Adoption Theory**

#### **a. Innovation Difusion Theory (IDT) dan Refined Innovation Difusion Theory (Refined IDT)**

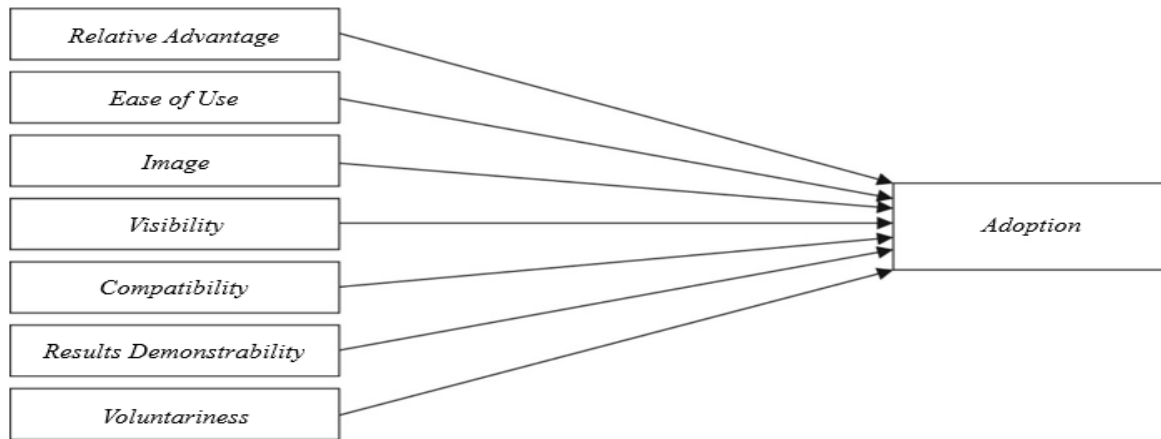
Rogers (Hamidfar, 2008: 32) says that Innovation Difusion Theory (IDT) is a model that describes the process by which innovations in technology adopted by users. Rooted in sociology, IDT has been used since 1960 to study a wide range of technological innovations, ranging from agricultural tools to innovation is organizational. The main construct of IDT such as relative advantage, compatibility, complexity, trialability, and observability. Here is a picture of a theoretical model of IDT.

Picture 2.1 *Innovation Difusion Theory (IDT)*  
Source: Rogers (Hamidfar 2008, p. 33)



In the field of information systems, Moore & Banbasat in Hamidfar (2008: 34) to adapt the characteristics of innovation in Rogers IDT models and add a set of constructs that can be used to study the acceptance of technology on individuals. Construct in Refined IDT include: relative advantage, compatibility, complexity, trialability, observability, ease of use, image, visibility, results demonstrability, and voluntariness of use.

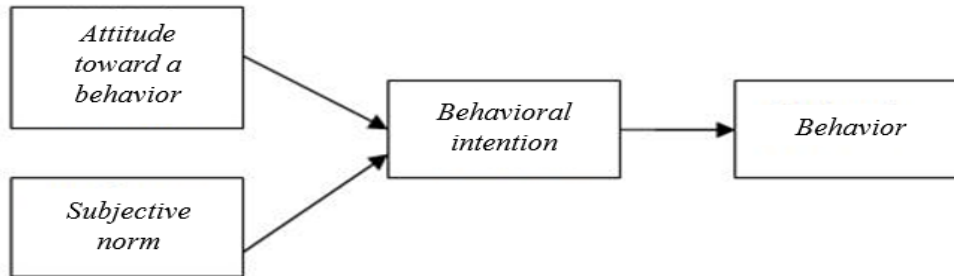
Picture 2.2 *Refined Innovation Difusion Theory (RIDT)*  
Source: Moore & Banbasat in Hamidfar (2008, p. 34)



## b. Theory of Reasoned Action (TRA)

Kings & Cribbins (Khristianto & Ali, 2009: 181) explains that in the late 1960s and early 1970s, Fishbein and Ajzen has started developing a theory that helps researchers to understand and predict the attitudes and behavior of individuals.

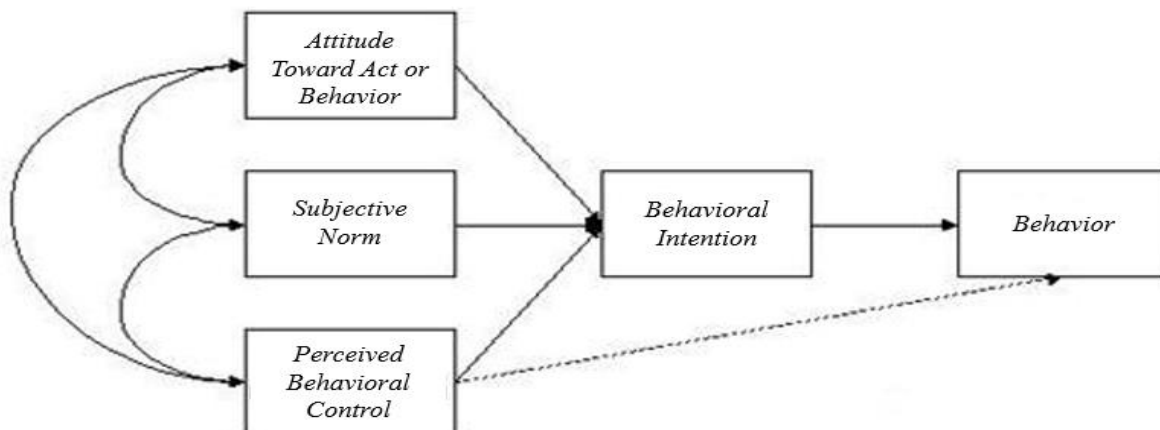
Picture 2.3 *Theory of Reasoned Act Action*  
Source: Fishbein & Ajzen (Sandaire 2009, p.18)



## c. Theory of Planned Behavior (TPB) dan Decomposed Theory of Planned Behavior (DTPB)

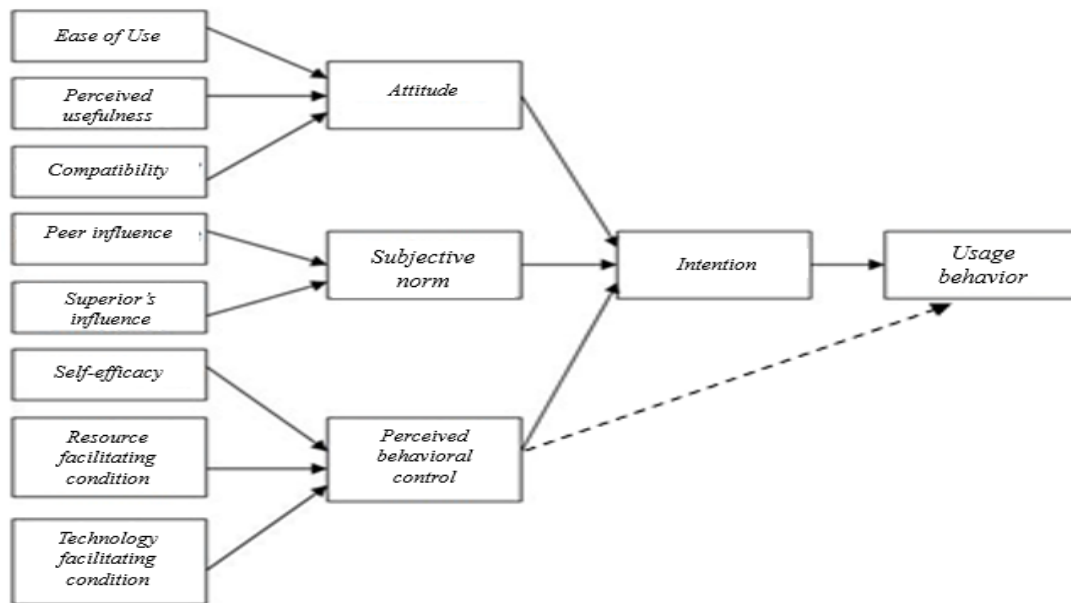
Ajzen (Khristianto & Ali, 2009: 182) states that TPB is an extension of TRA, namely with the addition of variables of perceived behavioral control besides behavioral and subjective norm, to explain situations in which the individual has no control over the behavior of interest.

Picture 2.4 *Theory of Planned Behavior* (Sandaire 2009, p. 19)



While DTPB outlines attitude, subjective norm, and perceived behavioral control to be the underlying structure of beliefs in the context of technology adoption. Here is a picture of DTPB technology adoption model.

Picture 2.5 *Decomposed Theory of Planned Behavior*  
(Taylor and Todd in Hamidfar 2008, p. 37)



So, DTPB is TPB development model that describes the attitude, subjective norm, and perceived behavioral control into the underlying structure of beliefs in the context of technology adoption.

#### d. Model of PC Utilization (MPCU)

Derived from the theory of Triandi human behavior give the perception that against TRA and TPB. Thompson et al. In Hamidfar (2008, p. 43) adapt and improve Triandi models in the context of information systems and use the model to predict the acceptance and use of the individual in the sphere of information technology. Construct in this model include: *job-fit, complexity, long-term consequences, affect toward use, social factors, and facilitating conditions.*

#### e. Motivational Model (MM)

Davies et al. (Hamidfar 2008, p. 44) apply theory to understand the adoption and use of technology. Based Davies et al. (Hamidfar 2008, p. 44), construct in this model include: motivaton extrinsic and intrinsic motivation. Extrinsic motivation is as the perception that the user is willing to carry out an activity for being instrumental in achieving valuable results are not of the activity itself. Intrinsic motivation is as the perception that the user is willing to carry out activities without a clear strengthening in addition to the process of doing the activity.

#### f. Social Cognitive Theory (SCT)

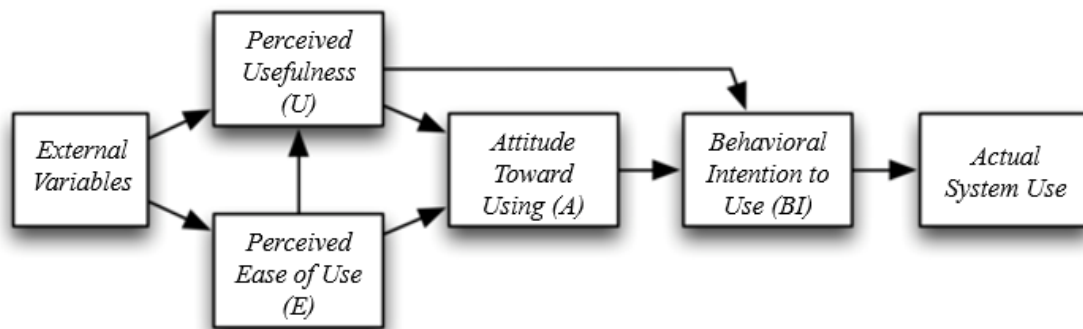
SCT is most powerful theory of human behavior (hamidfar 2008, p. 44). Compou & Higgins (Hamidfar 2008, p. 45) define the constructs in the SCT. Outcome-expectation performance is defined as the personal consequences of his behavior. Specifically, personal expectancy regards to esteem individual and sense of accomplishment. Self-efficacy is defined as an assessment of a person's ability to use technology to solve a particular task or job. Affect is

defined as individual preferences on a certain behavior. While Anxiety is defined as the onset of anxiety or emotional reaction when performing a behavior.

**g. Technology Acceptance Model (TAM and TAM2)**

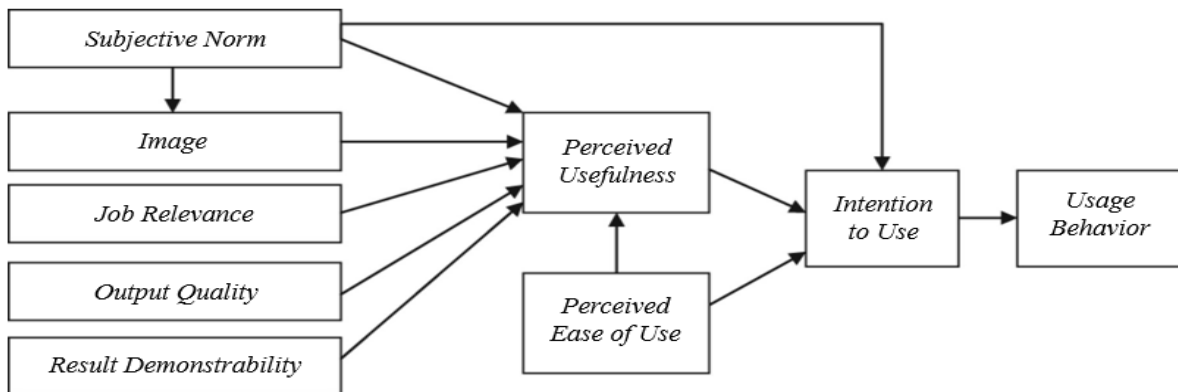
Lee et al. (2009, p. 154) state TAM has often been used by previous researchers to examine the variables that affect intentions and behavior of consumers towards technology products. The factors that could affect them is user perception of usefulness and ease of information technology use as an action that is reasonable in the context of technology users.

Picture 2.6 Technology Acceptance Model (TAM)  
Source: Davis (Hamidfar 2008, p. 39)



TAM has developed into TAM2. TAM2 expands TAM by adding subjective norm as additional predictor of intention. Here is image of TAM2 technology adoption model:

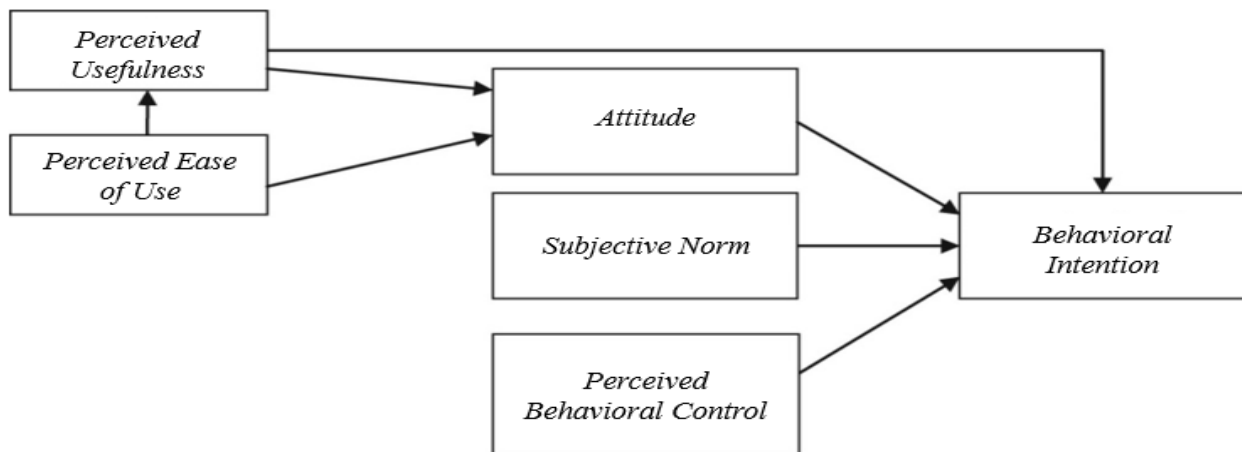
Picture 2.7 Technology Acceptance Model 2 (TAM2)  
Source: Venkatesh & Davis (Hamidfar 2008, p. 39).



Davis (Pratt 2010, p. 42) says that TAM seeks to explain and predict user acceptance toward information technology. TAM provides a theoretical basis to determine the factors that affect technology acceptance. Combined TAM and TPB (C-TAM-TPB). Taylor and Todd (Hamidfar 2008, p. 39) says that this model combines predictor in TPB with perceived usefulness in TAM to provide hybrid models. Core constructs in C-TAM-TPB among others: attitude toward behavior, subjective norm, perceived behavioral control, and perceived usefulness. Here is C-TAM-TPB theoretical model picture.

Picture 2.8 Combined TAM and TPB (C-TAM-TPB)

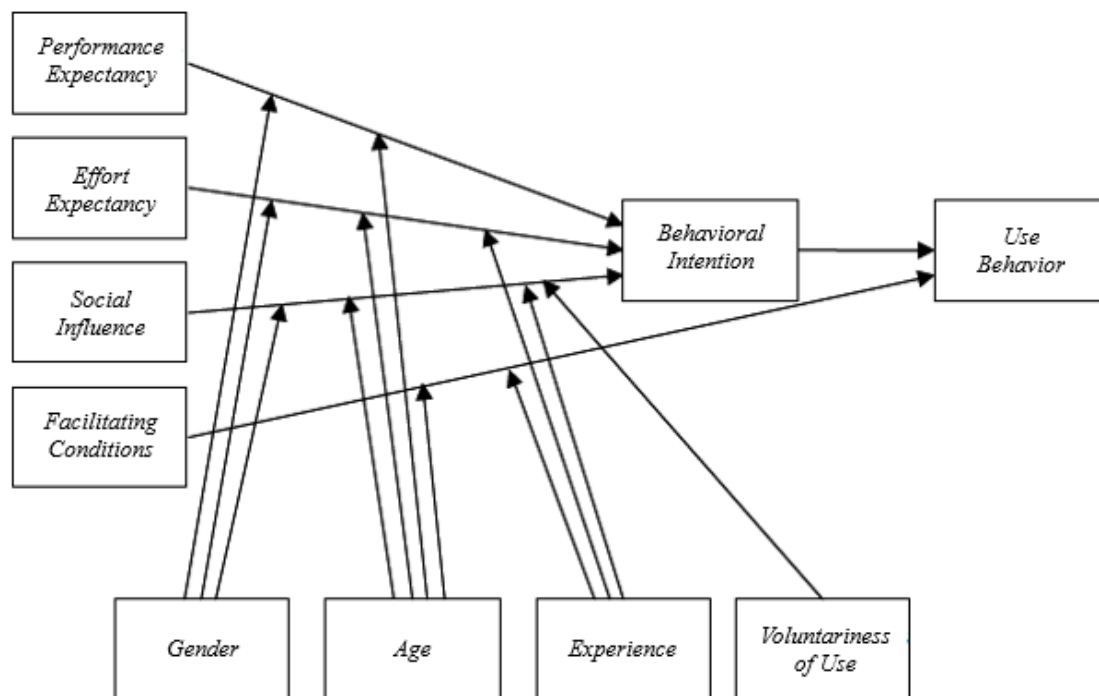
Source: Chau and Hu (Hamidfar 2008, p. 40)



## h. Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (Hamidfar 2008, p. 40) say that the formulation UTAUT goal is to integrate theory and research on individual acceptance to information technology which splintered into a unified theoretical model that's capable of capturing the essential elements of eight models before. In order to realize this, the eight previous theoretical models related to determinant on intention and use of information technology are compared, concepts and empirical equation in all models are used to formulate UTAUT. The Eight models include: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Motivational Model (MM), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT). According to Venkatesh et al. Core constructs in UTAUT include performance expectancy, effort expectancy, social influence, and facilitating conditions. Here is a UTAUT model picture:

Picture 2.9: UTAUT model picture

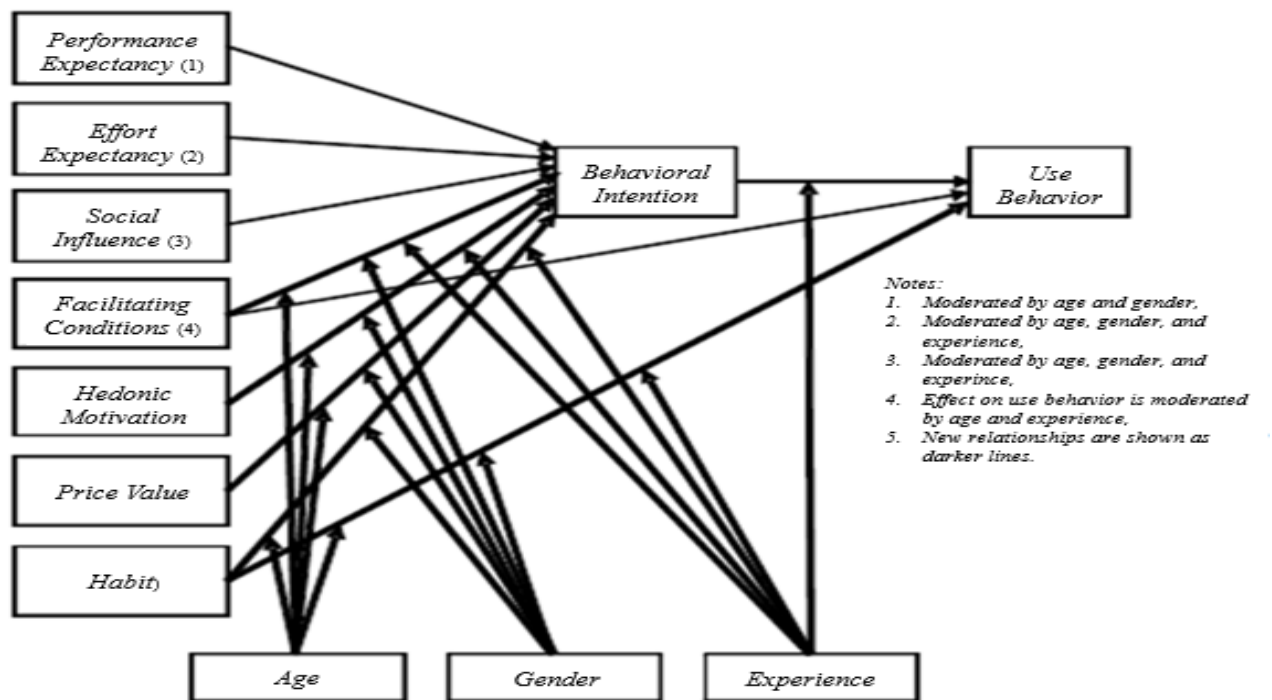


### i. Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2)

According to Venkatesh et al. (2012, p. 171) UTAUT2 is UTAUT development of organizational context into the context of consumer products. Independent variables in UTAUT2 include four independent variables in the previous UTAUT, performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). Venkatesh et al. (2012, p. 159) adds three additional independent variables into UTAUT2, namely Hedonic Motivation (HM), Price Value (PV), and Habit (HT). In UTAUT2, influence of PE, EE, SI, FC, HM, PV, and HT on behavioral intention (BI) is moderated by Age, Gender, and Experience. Additionally in UTAUT2, HT and FC have a direct influence on use behavior (UB), where HT is moderated by age, sex, and experience (experience). While FC is moderated by age and experience. Finally, BI has a direct influence on UB that is moderated by experience.



Picture 2.10: UTAUT 2 Model



### 3. The Methodology and Model

This research uses descriptive and causal research design. According to Indrawati (2015), usually descriptive study conducted factors or variables to measure an known object by researchers but unknown relationships between factors or variables, without noticing or performing relationship test or influence between factors or variables. While the causal research is used to analyze the relationship between variables or how a variable affects other variables (Umar 2013, p. 35).

This study refers to UTAUT2 models and modifications to adapt to characteristics of research object is interbank network. This is associated with over population in this study of prospective users of the service interbank network (Link), where users of interbank network service (Link) is banking. Then this study is limited to the Decision Making Unit (DMU) from bank which has debit card and/or credit card. DMU has a number of key players, namely initiators, gatekeepers, buyers, decider, users and influencers.

Techniques scale of measurement in this study is a Likert Summated Rating (LSR). Thus this through validity test phases that include content or logical validity, criterion-related validity and construct validity. According to Indrawati (2015, p. 147-148) content or logical validity ensure measurements made in accordance with logic and represents a set of items contained in the concept. While the criterion-related validity is if the measurement result of measuring instrument produces a different value for individual or object. Construct validity was conducted to determine how well the results that will be obtained from measurement instruments use can be same with the used theory. Construct validity uses product moment correlation, namely:

$$r = \frac{n \sum XY - \sum X \sum Y}{\sqrt{n \sum X^2 - (\sum X)^2} \cdot \sqrt{n \sum Y^2 - (\sum Y)^2}}$$

Then the used reliability coefficient calculation technique is reliability coefficient of alpha Cronbach by the formula:

$$r_{11} = \left[ \frac{k}{k-1} \right] - \left[ 1 - \frac{\sum ab^2}{at^2} \right]$$

PLS model evaluation is done by evaluating the outer and inner models models. Outer model is a measurement for assessing validity and model reliability. While the inner model is a structural model to predict the causal relationship among latent variables.

#### 4. The Findings

This research result use primary data in questionnaire result that's distributed to 220 respondents of 55 banks of issuing debit cards or credit cards. Data is supported by secondary data that the analysis is obtained from observation result in field and some literature sources to strengthen and deepen the analysis result by Partial Least Square (PLS) approach with software SmartPLS 3.0. The results of data processing using SmartPLS 3.0 Effort Expectancy variable has a path coefficient of 0142.

Table 4.1: Respondents answer againts Effort Expectancy variable  
Source: Research Data Processing, 2015

<i>Effort Expectancy</i>	Indicators	Respondents answer					Total	Index
		SD	D	N	A	SA		
EE1	Link service implementation easier	2	12	90	88	28	788	71.64%
EE2	Integrating Internet banking with easy Links system	0	7	49	113	51	868	78.91%
EE3	Integrating mobile banking with easy Links system	0	13	65	91	51	840	76.36%
EE4	Integrating SMS Banking with easy Links system	0	6	65	101	48	851	77.36%
EE5	Integrating ATM system with the easy Link system	0	2	61	111	46	861	78.27%
EE6	Integrating EDC systems with easy Link system	3	16	94	84	23	768	69.82%
EE7	Link transaction settlement procedures can be done easily	5	11	79	89	36	800	72.73%
<b>Total</b>							<b>5776</b>	
<b>Mean</b>							<b>825</b>	<b>75.01%</b>

The average value from item of variable response Effort Expectancy is 75.01%. The value if it's mapped in the continuum line is within affirmative answers range. Item that has the highest approval level is respondents can easily integrate the Internet banking by Link system. While item that has the lowest approval level is respondents can easily integrate EDC with Link system.

The data processing using SmartPLS 3.0 Facilitating condition variable has a path coefficient of 0.147. So, based on this value, it can be concluded that the Facilitating Conditions are variables that influence positively in the process of interbank network technology adoption.

Table 4.2: Respondents answer againts Facilitating Condition variable  
 Source: Research Data Processing, 2015

Facilitating Conditions	Indicators	Respondents answer					Total	Index
		SD	D	N	A	SA		
FC1	The company has the resources / channels such as ATM, EDC, Mobile Banking, SMS Banking to use the Link	0	7	53	123	37	850	77.27%
FC2	The Company has enough knowledge to use the Link	0	4	41	147	28	859	78.09%
FC3	Interoperability Link system with systems that are currently used by bank	0	6	67	129	18	819	74.45%
FC4	There are units / parties / people who can help when applying Link	4	10	79	101	26	795	72.27%
<b>Total</b>							<b>3323</b>	
<b>Mean</b>							<b>831</b>	<b>75.52%</b>

The average value from item on response Facilitating Condition variable is 75.52%. The value if it's mapped in the continuum line is within the approval answers range. Item that has the highest approval level according to respondents is the company has enough knowledge to use Link. While the item that has the lowest approval ratings according to respondents is 'there is unit / party / person who can help when applying Link'.

Based on the results of data processing using SmartPLS 3.0 performance expectancy variable has a path coefficient 0.250. Based on these values it can be concluded that Performance Expectancy is a variable that influences positively in the process of interbank network technology adoption. Here are profiles of respondents on the item of performance expectancy variable:

Table 4.3: Respondents answer againsts Performance Expectancy variable  
 Source: Research Data Processing, 2015

Performance Expectancy	Indicators	Respondents answer					Total	Index
		SD	D	N	A	SA		
PE1	Can improve service to customers	1	4	45	119	51	875	79.55%
PE2	The number of ATMs that can be used by customers will be more	1	5	27	140	47	887	80.64%
PE3	The amount of EDC merchant that can be used by customers will be more	0	4	24	168	24	872	79.27%
PE4	Customers can transfer bank to bank via internet banking	0	2	27	177	14	863	78.45%
PE5	Customers can transfer bank to bank via SMS Banking	1	6	52	148	13	826	75.09%
<b>Total</b>							<b>4323</b>	
<b>Mean</b>							<b>865</b>	<b>78.60%</b>

The average value from item on Performance Expectancy variable is 78.60%. The value if it's mapped in the continuum line is within approval answers range. Item that has the highest approval level according to respondents is the number of ATM by customers will be more widely used. While item that has the lowest approval rating according to respondents is customers who can make transfers between bank via SMS Banking.

At the result of data processing on Variable Price Value has a value path 0222. based on the value it can be concluded that the price value positively influence interbank network technology adoption process. Explanation of it, can be seen in the following table:

Table 4.4: Respondents answer Against Price Value variable  
 Source: Research Data Processing, 2015

Price Value	Indicators	Respondents answer					Total	Index
		SD	D	N	A	SA		
PV1	Companies' costs commensurate with the received services	0	19	56	92	53	839	76.27%
PV2	Links can be a new revenue stream for banks	1	13	64	93	49	836	76.00%
PV3	Expansion uses Link cheaper than building its own ATM network	1	14	54	102	49	844	76.73%
PV4	Expansion uses Link cheaper than building a network of EDC itself	0	8	60	100	52	856	77.82%
PV5	Links provide more benefits to customers compared to the costs incurred by the company	1	33	64	88	34	781	71.00%
<b>Total</b>							<b>4156</b>	
<b>Mean</b>							<b>831</b>	<b>75.56%</b>

The average response on price value variable is amounted to 75.56%, so it is included in approval answers range as mapping continuum line. The highest approval level item is the expansion of using the Link is cheaper than building its own network of EDC. While the lowest approval level item is Link provides more benefits to customers than the cost that issued by the company.

On the result of processing data of security and privacy variable has a path coefficient 0.285, It means that the value is greatest when compared with value of other independent variable coefficient path. That is, security & privacy give greatest positive impact in process of interbank network technology adoption. This is proven by the following caption:  
 Table 4.7 Respondents answer Variable Against Security & Privacy

Table 4.5: Respondents answer Against Security and Privacy variable  
 Source: Research Data Processing, 2015

Security & Privacy	Indicators	Respondents answer					Total	Index
		SD	D	N	A	SA		
SP1	Link network owned by Telkom	0	8	66	89	57	855	77.73%
SP2	Link network is managed by Telkom	0	6	68	89	57	857	77.91%
SP3	Link uses the private network	1	20	76	80	43	804	73.09%
SP4	Link financial transaction information is submitted in confidence from bank to bank	0	13	66	89	52	840	76.36%
SP5	Information is submitted in confidence to customers	1	9	79	81	50	830	75.45%
SP6	Telkom is reliable and precise to correct errors / failure	0	9	80	88	43	825	75.00%
SP7	Link is audited by Bank Indonesia (BI) and the Financial Services Authority (FSA)	0	9	83	86	42	821	74.64%
<b>Total</b>							<b>5832</b>	
<b>Mean</b>							<b>833</b>	<b>75.74%</b>

## Analysis of Partial Least Square

This analysis uses several analytical testing: *first*; using the Average Variance Extracted method (AVE) with SmartPLS 3.0 application. The test results on all of used variables in the research questionnaire has AVE value that is greater than the expected value (0.5). It shows that all variables are valid for hypothesis testing. So that the result of data processing is known that AVE value for dependent variables and independent variables above the specified threshold, with the permitted threshold is  $\geq 0,5$ , all variables showed a range of values between 0.523 to 0.892. Thus, it can be said that the model in this study meet the convergent validity.

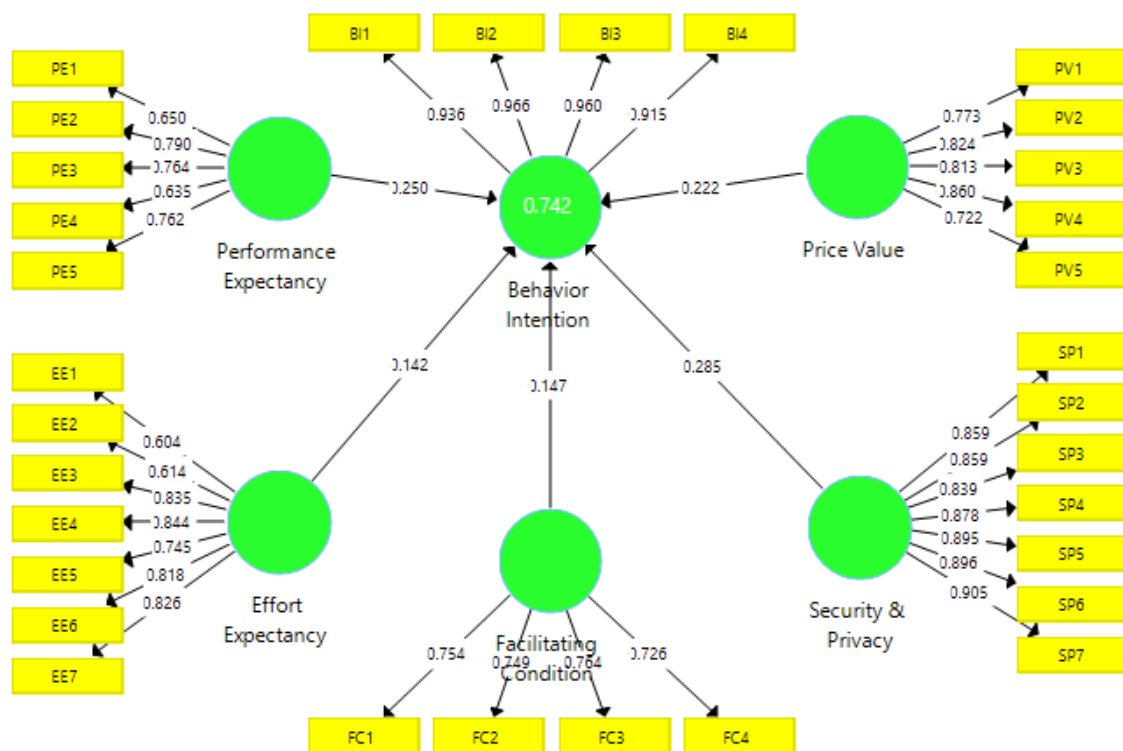
*Second*; testing Discriminant Validity by using Cross Loading method in SmartPLS 3.0 Application. The test results showed that all indicators used in the questionnaire of study showed greater correlation value with its own latent variables than other latent variables. It shows that all valid variables to be included in hypothesis testing. For example indicator BI1, BI2, BI3, BI4 againts variable of BI construct is (0936), (0966), (0960) (0915), is higher than the loading factor from each indicators to other construct variable, so that it can be said all indicators has good validity. This shows that all valid variables to be included in hypothesis testing.

Third; Internal Consistency Reliability testing performed by SmartPLS 3.0 application, shows the test results of Composite Reliability (CR) and Cronbach's Alpha (CA) to all variable has a value above 0.7, so it can be considered valid for inclusion in hypothesis testing.

### Structural Model Analysis (Structural / Inner Model)

After testing the model outer, subsequently inner model is performed by observing the R-square on the construct independent variables and t-value of each influence on dependent latent construct that's obtained through bootstrapping process. Through SmartPLS 3.0 application, the bootstrapping process can be taken path diagram of research structural model as follows:

Picture 4.1: Diagram of the Inner Path Model Research



Attention to R-Square test is used to measure the rate of variation in dependent variable change against independent variables. So, if the R-square value becomes higher, the model is better can predict from the object of research. Therefore, based on the processing data of research, it appears that the value is 0.742. That is the percentage of the amount of Behavior Intention can be explained by the Effort Expectancy, Facilitating Condition, Performance Expectancy, Price Value, and Security & Privacy amounted to 74.2%. R-square value shows that the research model is in substantial category.

Based on this research, security and privacy have the highest influence on the adoption of inter-network service (Link) with a path value (0.285). This proves that the aspects of security and privacy in the banking industry is paramount, because the information in it regarding the financial crowd.



## 5. Summary and Conclusions

This research can conclude several things: *first*; all the factors in the Modified Unified Theory of Acceptance and Use of Technology 2 (Modified UTAUT2) in this study proved to be a significant positive influence intention of users prospective to adopt interbank network service in Indonesia. *Second*; order of greatest influence in the Modified Unified Theory of Acceptance and Use Technology 2 on the model of interbank network service adoption in Indonesia, starting from the biggest influences are Security and Privacy (0.285), Performance Expectancy (0.250), Price Value (0.222), Facilitating Condition (0.147) and the Effort Expectancy (0,142).

This value can be defined as the amount of factors that affect the intention to carry out interbank network service adoption. Third, the R2 value of 0.742, which means interbank network services of behavior intention in the model can be explained by a Modified UTAUT2 Security and Privacy, Price Value, Effort Expectancy, Faclitating Condition and Performance Expectancy of 74.2%. Thus this model can be used to predict the intentions of prospective users in Indonesia in conducting interbank network services with predictive capability of 74.2% to the category of moderately strong.

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