Trust and Perception of Benefits as the Determinants of Behavior and Intention to Use Internet Banking in Indonesia

ENDANG SITI ASTUTI, MOCHAMMAD AL MUSADIEQ, HAMIDAH NAYATI UTAMI, MOHAMMAD IQBAL
Faculty of Administrative Science
Brawijaya University
MT. Haryono Street 163 Malang, East Java
INDONESIA

Abstract: - Examine the effect of trust on perceptions of ease of use, as well as its impact on attitudes and interests in using internet banking. This research employed a survey method, in which samples were selected from a population. This research took place in national banking institution in East Java Province which have utilized internet banking facilities. The population of this study were individuals who made transactions using internet banking of Bank BCA, Bank Mandiri, Bank BNI, Bank BII and Bank CIMB Niaga in East Java region. The findings of this research, which most coefficients are found significant indicate that the results provide strong support for most of the hypothesized influences. This research also confirms the suitability of TPB and TAM as appropriate models in explaining individual attitude in adopting internet banking. These results also support that the TPB and TAM models can be modified by involving trust as an intervening variable. The Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) are regarded well-established and highly accepted model for predicting end-user acceptance of new technology. Currently, TAM and TPB provide important theoretical contributions in understanding the acceptance and the use of an information system. A number of studies have been conducted to re-examine, expand and apply TAM and TPB as the basic research model in research related to internet banking adoption.

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1 Introduction

The world development in the late twentieth century was marked by rapid advancement of information technology which has resulted in a novel technological revolution. This condition is regarded a revolution since the development of general purpose technology influences other kinds of technology, modifying the basic order of the society, nation and state. Information technology keeps growing rapidly and it is believed to continue growing within aggressive rate within the next few years. This increasing information technology capability is expected to change the way people live and work. Advancement in technology also significantly contributes to the economic growth, besides it influences the social order within a society.

The rapid advancement of the information and communication technology also has major effects on companies as some companies become encouraged to use technology. They believe that technology is a key to maintain their business and stay competitive in the market. Information technology facilitates various organizational process activities which are important for managers and professionals in order to achieve certain company goals in the future. Information technology also plays an important role for companies that intend to improve the quality, efficiency and effectiveness in achieving their goals. It is required for companies that wish to win certain business competition to apply technology in this era.

The utilization of cyberspace information technology is predicted to dominate all company activities as it plays major impacts for every company. Of the impacts is the tighter competition, in which companies are required to immediately improve their ability in order to adapt into various changes in order to be able to compete with other competitors. In the era of information technology, massive amounts of information are available and accessible through sophisticated computers connected to high-speed communication networks such as the internet, WAN (Wide Area Networks) and LAN (Local Area Networks) to support company activities. This advanced information technology allows an

organization to grow stronger, accessible and more flexible.

One type of information technology that can be used to increase business competitiveness and product sales is the utilization of electronic commerce (e-commerce) to market various types of products or services, both in the forms of physical and digital through internet. The utilization of internet has been tremendously developed in the field of business, especially among large-scale companies. Ever since the Internet was first introduced in 1969, it quickly gained popularity as a potential medium for electronic commerce in cyberspace (http://www.wikipedia.org). Internet has been used extensively as it provides enormous benefits for companies to run their business operations in order to achieve certain corporate goals.

Likewise, the banking field has set information technology and internet as a part of the de facto standard. Internet banking feature has started to emerge as a service provided by banks for customers. The need for optimal services is unavoidable as the demand of the services becomes increasingly high. At the present time, customers prefer making transactions through various alternative channels such as Automated Teller Machines (ATMs), internet, telephone or SMS messages (Short Message Service), to queuing at banks. Customers need fast, accessible, convenient, and less expensive banking services. The internet banking feature offers various benefits for banks in carrying out its operational activities.

Regarding the benefits of internet for banking, it is important that each bank develop its internet banking sites in order to stay competitive in the market. Internet banking services open new paradigms, new structures and new strategies in the field of banking [26]. Internet banking is a strategic tool that will revolutionize the way banks develop their competitive advantages. Banking services allows clients to access websites that provide direct banking services without having to visit the bank. Internet banking website makes it easier for customers to do various banking activities as they are able to access the site that offers them various features; checking their inquiry, fund transfer to other accounts, making payments and others [17]. Moreover, this site can be directly accessed by customers to check the inquiry of their of their savings or current account, or to make transactions while they are on vacation in other parts of the world. Internet banking features provide optimal satisfaction to customers.

Customer satisfaction should be seen as the priority in of a bank. Customer satisfaction can be enhanced by providing ease of use of the internet banking website, faster speed of data transmission and data security related to customers' financial transactions. Hence, reliable data storage and communication systems are absolutely necessary. Those aspects are as urgent as the needs of transactions between customers within one bank and between different banks. Banking service should be provided regardless of time and place [17]. The readiness of bank managers to provide better services for customers depends on the availability of supporting infrastructure. The infrastructure includes applications for data management and storage and data communication networks that connects between the delivery channels and bank data centers. Data communication systems require a reliable back up system to obtain the high rate data service availability. Bank managers are required to build a data storage system and its backup in DRC (Disaster Recovery Center) in order to keep customers' data secure even within the worst conditions.

Data security and efficiency of internet banking transactions give more benefits to customers than other types of banking services. Two benefits of Internet banking services for customers, the first benefit is that customers are not required to buy any software for all transactions occur in the server of the bank [18]. Second, customers are able to use the banking services for 24 hours non-stop regardless of places.

Internet banking indeed provides abundant benefits to customers. However, banks should regard various factors determining the success adoption of internet banking technology. Users' real experience and literature related to internet banking show that the success of internet banking is determined by how customers adopt the system. Therefore, it is important for banks to find out how customers appreciate the services provided in internet banking. This insight will help the bank to determine proper strategic plan to increase the market share.

Internet banking has become a global phenomenon. However, the penetration of internet banking in developing countries still needs improvement compared to the one in developed countries. One of factors that hinders the adoption of technology is the fact that the development is rather difficult in developing

countries and poor countries than in developed countries [2]. Likewise in Indonesia, as a developing country, problems that occur are not much different from problems that occur in other Southeast Asian countries. This insight is reinforced by the results of the International Telecommunication Union (ITU) survey done in 2010 which shows that Indonesia ranked 107th out of 159 ITU member countries in the world. It should be noted that the ITU determines the ICT Development Index which is measured from 4 dimensions; connectivity, accessibility, policy and diffusion.

Nevertheless, related to the rapid development of information and communication technology, the national banking industry in Indonesia has been considered relatively advanced. Especially when it is compared to other sectors. This is evidenced by various types of technology which have been adopted including Automated Teller Machine, Banking Application System, Real Time Gross Settlement System, Electronic Clearing System, and internet banking. Particularly related to internet banking services, the number of internet banking users keeps increasing from year to year. The data released by Bank of Indonesia in 2010, the number of customers who used internet banking for banking transaction in 2009 reached 2.5 million with total transactions of more than 250 million transactions which valued approximately Rp. 1,502 trillion. Compared to 2008 which number of internet banking customers only reached 1.5 million with 79 million transactions and amount of money circulated approximately Rp 207 trillion, the number of users has significantly increased.

High public interest in internet banking is responded by the increasing number of banks that provide internet banking services. Bank Indonesia in 2005 reported that 18 banks provide internet banking services for both corporate and individuals banking service. Within five (5) years, this number has increased to 32. This increase has been supported by the intensive penetration of into both society in general and bank customers along with the extensive use of internet push mail through mobile phones.

The fact that the use of internet banking has been increasing at significant rate is not followed by equal number of internet banking users. The number of active internet banking users is relatively small compared to the number of customers who do not use internet banking. This phenomena often occurs related to adoption of technology, especially internet banking in almost any developing countries such as Thailand, the Philippines, including Indonesia, in addition to the problem related to the lack of telecommunications infrastructure. User's profile is also an influential factor as it relates to to income distribution, education level, technical skills and demographic problems.

Ever since the advent of TRA (Theory of Reasoned Action), TAM (Technology Acceptance Model), the model of technology adaptation based on users' behavior has been an interesting issue among researchers, especially in today's era of digital technology. There have been many studies resulting in similar findings related to the determinants of internet banking adoption [2,3,22,29,32]. Those studies generally show inconsistent results. There has not been any agreement yet in the determination of factors that influence customer decision to use internet banking services. This problem might arise due to the adoption of different models, resulting indifferent technology acceptance models since the results depend on the factors that are involved in designing the model.

Literature review in the field of information technology and information systems was conducted by Kusuma showing TAM (Technology Acceptance Model) as the most popular model in measuring the users' acceptance toward technology [21]. This model was first introduced by Fred Davis in 1986 in his dissertation administered at the Sloan School of Management, Massachusetts Institute of Technology entitled "A Technology Acceptance Model for Empirically Testing for New End-User Information System: Theory and Results". Furthermore, the dissertation was published in a scientific work entitled "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology" in the Quarterly MIS journal in 1989. This work has been regarded the original work on the technology acceptance model. The popularity of Davis' model can be seen from the number of other researchers who cited the papers. In January 2000, the Institute for Scientific Information's Social Science Citation Index recorded that those two journal articles written by Davis had been cited 517 times.

The TAM theory is derived from a grand theory in the field of study of belief, attitude and behavior proposed by Fishbein & Ajzen under the name Theory of Reasoned Action (TRA) [13]. The Davis model which is adapted from TRA assumes that a person adopting a technology is generally determined by cognitive

processes and aims to satisfy his use or maximize the usefulness of the technology itself. In other words, the main key to information technology acceptance is users' evaluation of the usefulness of the technology. Furthermore, Davis considers that two individual beliefs, namely the perceived usefulness and perceived ease of use, are the main factors determining the adoption of information technology [1]. TAM has been widely used in technology adoption research for it provides simple theory (parsimony) that is supported by valid data besides it can be applied to predict the acceptance and use technological innovation products in various fields (generalibility).

In addition to TAM model, there is another technology adoption model called the Theory of planned Behavior technology acceptance model which was popularized by [1]. This theory provides clear purpose and benefits in predicting and understanding the motivational influences on behavior which are not under individual control or will. Besides this theory identifies how and where to direct strategies related to behavioral changes, it also explains each important aspect of human behavior such as the reason behind somebody's interest in using internet banking.

This TPB model provides a framework for studies on the association between attitudes and behavior. The most important determinant of a person's behavior is the intention to behave. Individual intention to display certain behavior is formed by a combination of attitudes to display subjective behavior and norms. Individual attitudes toward behavior include their beliefs about certain behavior, evaluation of behavioral consequences, subjective norms, normative beliefs and motivation to comply [36]. If someone perceives that the result of displaying a behavior is positive, then he tends to show positive attitude towards the behavior and vice versa.

Positive subjective norms occurs when a person perceives that it is positive to display certain behaviors and he/she becomes motivated to meet the expectations of other relevant people. But if other people perceive certain behavior as something negative while someone wants to meet the expectations of others, then it is a negative subjective norm. Subjective attitudes and norms are measured by scale, generally the Likert scale used. The scale uses phrases like / dislike, good / bad, and agree / disagree. One's intention to display certain behavior depends on the results of the measurement of attitudes and subjective norms.

TPB (Theory of Planned Behavior) is regards the assumption that humans are rational beings who use information systematically. People measure the implications of their actions before deciding whether or not they do certain behaviors. Within the context of TPB, Ajzen and Fishbein were not only interested in predicting the behavior but also in understanding it, and they tried to identify the determinants of these behavioral intentions [1]. They theorized that intention is a function of two main determinants, namely a) attitude towards behavior and b) subjective norms of behavior.

Research and discussion on this theory have also been widely carried out ever since the initiators began publishing it, even by the initiators themselves. For example, in 1969 Ajzen and Fishbein examined the way of predicting the intention to behave within certain determined situation [1].

Many other researchers also adapted TPB as a framework to verify the theory in different settings and in different places, which results confirmed the validity of the theory including [1,6,15,20,23,24]. These studies were also done using TPB as a tool to predict specific behavioral intentions in adopting information systems

The Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) are regarded well-established and highly accepted model for predicting end-user acceptance of new technology. Currently, TAM and TPB provide important theoretical contributions in understanding the acceptance and the use of an information system. A number of studies have been conducted to re-examine, expand and apply TAM and TPB as the basic research model in research related to internet banking adoption.

Based on the description above, it is considered necessary to use a model with right approach to make users perceive certain information technology in a positive way [12]. In addition to the need to identify factors that can influence customer's intention to use internet banking, it is also important to make sure that customers' responses provide valid clues to assist the banking industry in formulating proper marketing strategies including efforts to promote new forms of internet banking system.

This study employed the variables proposed TPB and TAM including perceived usefulness, trust, attitude and interest in the use of internet banking. This research investigated the development of TPB and TAM models to identify the dominant factors that influence

customers in adopting internet banking. Based on the background and problems, this study was done to examine the effect of trust on perceptions of ease of use, as well as its impact on attitudes and interests in using internet banking.

This research will test empirically the theory of planned behavior. Theory of planned behavior (TPB) is a technology acceptance model theory formulated by Ajzen in 1988. Ajzen (1988) in TPB states that a person's intention to carry out a behavior determines whether the behavior will be carried out or not. The intention to do or not to do a certain behavior is influenced by the attitude. The results of this study are expected to contribute to the study of the impact of thinking about theory of planned behavior. This study also empirically tests the technology acceptance model theory. Technology acceptance model (TAM) is a technology acceptance model theory to explain the technology acceptance model to be used by technology users. Behavior using technology is preceded by the perceived usefulness of a technology [8]. Perceived usefulness affects the attitude of individuals towards the use of technology, which in turn will determine whether people intend to use (intention) of the technology. The results of this study are expected to contribute to the study of the impact of thinking about the technology acceptance model theory.

2 Literature Review

The originality of this research is in the incorporation of two models; TAM (Technology Acceptance Model) and TPB (Theory of Planned Behavior) into a theoretical framework. Both TAM and TPB models are used as the basic model in this research for both models are well-established and they are widely-accepted models for predicting end-user acceptance of a newly applied technology. Currently TAM and TPB are highly important theoretical contributions in understanding the acceptance and use of certain information system. Some researchers have re-examined, expanded and used TAM and TPB as a basic model for their research on the adoption of internet banking.

TAM and TPB are useful behavioral models to answer why some information systems fail to apply due to weak interest (intention) of users in using the technology [5]. There are limited number of information system application models that include psychological factors or behaviors into the model. These two models are parsimonious models, meaning that these models are simple yet valid [5,22]. Designing a simple but valid model is not an easy task. There was a trade-off that occurred in the making of the model. A simple model requires the use of many assumptions that other factors are not considered to have certain effect on the model. Consequently, this will decrease the quality and validity of the model. Conversely, if a model is valid and complete, many factors must be involved into the model, making the model become more complex.

In this research, TAM and TPB models were developed by adding trust as an intervening variable. The confidence variable in this study is the trust among banks that provide internet banking feature and trust related to the security of service features in internet banking. As a developing country, Indonesia that has just implemented the internet banking feature must pay attention to the factors related to customer trust in internet banking security [17]. Regarding to the fact that various cyber crime occur, such as account hacking, trust becomes an tremendously important factor in the utilization of internet banking to facilitate banking transactions. The fact proves that the development of internet banking system contains potential risks, as asserted by [14].

Based on this conceptual framework, results of empirical studies and literature review, and in accordance with the formulation of the research problems and objectives which have been previously proposed, this study was administered to analyze various variables that influence customer acceptance in using internet banking services. The variables include customer perceived ease of use, perceived usefulness, trust, subjective norms, perceived behavioral control and interest to use (intention)

The hypotheses of this research were formulated as follows.

2.1 Trust

Internet banking provides benefits for customers and banks, but internet banking also opens up opportunities for criminals to do cyber crime using internet banking. Security and confidentiality issues of the personal and financial data in internet banking are often questioned by customers before they decide to use internet banking. Banks that can convince the customers related to the security and confidentiality of customer data will likely to gain stronger customer trust.

In internet banking transactions, banks store massive customer information which might

allow errors to occur due to incomplete information or invalid information. To build long-term relationships with customers, banks must always communicate with their customers, making the customer feel safe and grow stronger trust toward the bank as customers can easily obtain the information they need from the bank. If a web site can enhance its social communication including openness, responsiveness and information quality, it is likely that the website has met the needs of internet users (Mukherjee and Nath 2003).

From the results of a survey, approximately 70% to 80% of internet banking users in Indonesia are from four provinces; Jakarta, East Java, West Java and Yogyakarta [30]. While the most frequent case of internet banking crime in Indonesia is account hacking experienced by some customers of Bank Central Asia who used Klikbca (Kompas 2002). Regarding to the increasing crime cases using internet banking such as account hacking, trust becomes an important factor in the utilization of internet banking for banking transactions. In this context, trust is in a form of customer belief in the security of various internet banking.

Trust is a certain party's trust in another in conducting a transaction relationship based on a belief that the person he / she trusts will fulfill all of his / her obligations properly as expected [4]. The importance of confidence as a variable that influences customer interest in adopting internet banking has been proven by many researchers, including [26]. The results of those research state that trust significantly influences customer decision to use internet banking technology.

Based on the description above, hypotheses of this research were proposed as follows:

H1 : Trust significantly influences the perceived usefulness of internet banking.

H2 : Trust significantly influences customer attitude in using internet banking.

H3 : Trust significantly influences customer intention in using internet banking.

2.2 Perceived Usefulness

Usefulness as a level to which a person believes that the use of a particular subject can improve the work performance [8]. Whereas, usefulness refers to the level where a person believes that the use of a particular technology will improve his/her performance. Individuals who find the ease of using internet will find technology beneficial. Based on this definition, it can be interpreted that the use of internet banking can improve one's work performance and community performance.

Several dimensions of the usefulness of IT. The benefits can be divided into two categories as follows [7].

(1) Usefulness with one factor estimated

(2) Usefulness with two factors estimated (benefit and effectiveness).

The usefulness with one factor estimated includes these following dimensions;

1. Making job easier
2. Useful
3. Increasing productivity
4. Enhancing the effectiveness
5. Improving job performance

Perceived usefulness of internet banking refers to the positive effects obtained by customers in completing their tasks or work. An internet banking service will be useful if it is user friendly and the system is able to enhance the interaction between banks and customers as users. So, the bank as a service provider is trying to socialize it to their customers through face to face socialization. For instance, some banks provides flyers containing easy-to-understand steps to use internet banking services for customers to learn at home. Furthermore, banks also provide 24-hour services to help customers with various questions related to internet banking. Internet banking feature allows customers to access banking services including inquiry checking, fund transfers, information about exchange rates and so forth via cellphone in an efficient way without wasting much time and cost, besides the feature is also available even in holidays. It can be concluded that the level of internet banking utilization affects the attitudes and interests of customers towards the use of the internet banking service system.

Attitude refers to individual's general assessment of cognitive beliefs built on attributes related to technology. Perceived usefulness is the cognitive belief that forms one's attitudes. There is a positive influence between cognitive beliefs and attitudes, meaning that the more positive beliefs the more positive one's attitude towards internet banking. The results of Alsajjan (2009) studies showed the effect of perceived usefulness significantly influences the attitudes. Adequate technological support will encourage improvement in individual performance, increase productivity and job satisfaction which in turn will result in the increase in competitiveness and

profitability within organizational level. Some studies show that the perceived usefulness has a significant effect on one's interest in using technology including Alsajjan (2009). From the explanation the hypothesis tested is:

H4 : Perceived usefulness significantly influences one's attitude in using internet banking.

H5 : Perceived usefulness significantly influences one's intention to use internet banking.

2.3 Attitude

Attitude refers to either positive or negative action someone shows when using technology [8]. Instead, it can be inferred from ones' reactions. Attitudes cannot be observed directly but it require self-disclosure of the person concerned. The disclosure of this response reflects either positive and negative responses someone shows toward certain object.

An attitude that influences interest in using internet banking [6]. The relative contribution of attitudes to predicting interest in use can vary as a function of the behavior and population studied [1].

The use of information technology that employed 3 models namely TAM, TPB and TPB resulting in different results [7]. The result of TAM test showed that the influence of attitudes on intention in using technology was insignificant, while the other 2 models, TPB and TPB, found attitudes significantly influenced the intention in using technology. The results of other research done by [7,8]. Based on the research gap, the hypotheses of this research were formulated as follows:

H6 : Attitude significantly influences customers' intention in using internet banking.

There were 7 hypotheses analyzed in this research since there were 6 endogenous variables. Furthermore, based on researchers' perception on the theory, the researcher has drawn a new line of relationships from the above hypotheses models as seen in Figure 1.

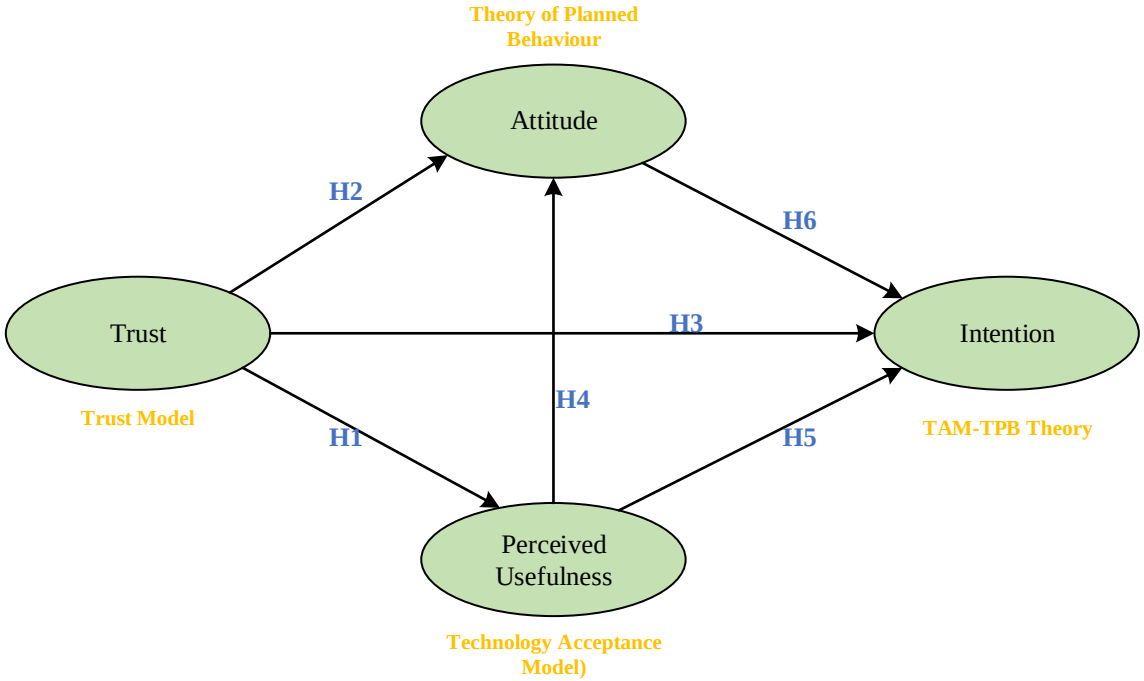

Fig.1 The Conceptual Framework

Research that combines the use TAM and TPB models by adding trust variable as an intervening variable has never been previously conducted in the field of the ue of internet banking technology in Indonesia, although the development of this model has been carried out by several researchers. This occurs as various research on the adoption of internet banking technology in Indonesia employed TAM model as a single approach or adding the TAM with trust as the mediating variable. The development of TAM and TPB models in which trust is the intervening variable is used to identify a number of factors that influence customer acceptance in using internet banking services.

3 Research Method

This research employed a survey method, in which samples were selected from a population. A set of questionnaires was used as the as the main data collection instrument. This research took place in national banking institution in East Java Province which have utilized internet banking facilities. The units of analysis in this study were individuals who were internet banking customers. The customers referred to in this study were customer who have adopted technology or used internet banking services after the pre-adoption stage. The population of this study were individuals who made transactions using internet banking of Bank BCA, Bank Mandiri, Bank BNI, Bank BII and Bank CIMB Niaga in East Java region.

Samples were selected using a non probability sampling technique and convenience sampling method regarding to the fact that the number of internet banking customers in East Java was unknown, making it possible to use those sampling techniques. Therefore, the minimum number of samples in this study was 5 x 42 = 210 customers. Based on the results of the study, 5 banks already employ internet banking services including Bank BCA, Bank Mandiri, Bank BNI, Bank BII and Bank CIMB Niaga in the East Java region. There were 300 questionnaires distributed to the respondents, which 270 of them were returned. There were a total of 12 respondents did not provide answers because they were busy, and 18 respondents gave incomplete answers.

The research model was designed to examine the effect of the independent variable on the dependent variable. This form of this causal relationship required an analytical tool in order to simultaneously explain this relationship. Regarding to this requirement, the Structural Equation Modelling (SEM) was employed in this research. The use of SEM as an analytical tool, apart from being based on the reasons for the complexity of the model used, is also based on the limitations of multidimensional analysis tools that are often used in quantitative research, such as multiple regression, factor analysis, descriminant anaysis, and others. Some of these analytical tools have a major drawback, namely that they can only analyze one relationship at a time. In the research language, it can be stated that the analysis technique can only test one dependent variable through several independent variables. In fact, the management of the company is faced with a situation that there is more than one dependent variable that must be linked to each other to determine the degree of interrelation [10].

Furthermore, as an extension or combination of several multivariate techniques [10]. Structural equation modeling (SEM) is a collection of techniques that allows testing a series of relatively complex relationships simultaneously. This complicated relationship can be formed between one or more dependent variables with one or more independent variables. Each of the dependent and independent variables can be in the form of factors or variables built from several indicator variables. Of course, these variables can be in the form of a single variable that is observed or that is measured directly in a research process. On the other hand, SEM is also an integrated approach between data analysis and construction concepts. In SEM, researchers can carry out three activities simultaneously, namely checking the validity and reliability of the instrument (equivalent to confirmatory factor analysis), obtaining a model of the relationship between latent variables (equivalent to path analysis), and obtaining a model that is useful for measuring (equivalent to a model structural) or regression analysis).

4 Results and Discussions

The causal relationship developed in the hypotheses of this model was tested using the null hypothesis which stated that the regression coefficient between two contract relationships was not different from zero through the t-test as in the regression analysis. The following table describes the results of test on the structural model proposed in this study. Hypothesis testing on the structural model correlates with the results of the regression coefficient test administered to each generated path as follows:

Table 1. The Results of the Regression Coefficient Analysis of the Influences among Variable in the Final Model

Relationship		Reg.Coefficient	SE	CR	p-value	Std. Coef	Hypo Theses	Decision
From	to							

Trust	Usefulness	0.867	0.154	5.646	0.000	0.477	**H_1**	Accepted
Trust	Attitude	0.222	0.104	2.129	0.033	0.147	**H_2**	Accepted
Trust	Intention	0.493	0.114	4.316	0.000	0.266	**H_3**	Accepted
Usefulness	Attitude	0.136	0.056	2.410	0.016	0.164	**H_4**	Accepted
Usefulness	Intention	0.194	0.089	2.182	0.029	0.197	**H_5**	Accepted
Attitude	Intention	0.452	0.082	5.509	0.000	0.379	**H6**	Accepted

4.1 The Influence of Trust on the Perceived Usefulness

Hypothesis 1 states that trust has a significant effect on the perceived usefulness among customers in using internet banking. Table 1 shows that the regression coefficient of the trust variable on the perceived usefulness at 0.867 and CR 5.646 (p = 0.000). The result of the calculation with significance level set at 0.05 shows CR table of 1.96, in which the calculated CR value is greater than the CR table. It can be inferred from the result that the regression coefficient is considered significant. The result of this research supports the view that trust has a direct and significant influence on perceived usefulness. Thus, hypothesis H8 which states that there is a direct influence between the trust (significant) and the perceived usefulness to use internet banking is accepted. This result goes consistently with the results of research conducted by Lee and Baraghani confirming the existence of direct and significant influence of trust on the perceived usefulness [2,22].

The results of the research stating that trust has a significant influence on one's perceived usefulness in using internet banking is an important finding because in order for a technology to be perceived useful, it has to be trusted at first in terms of the security related to customer transaction data. Interestingly, though much research shows abundant benefits, on the other hand, internet banking also triggers considerable impact [27]. At the very least, the threat of breaking into one's bank account is one of the evidences. This issue should be overcome immediately otherwise it could trigger anxiety related to internet banking adoption which might negatively affect users' intention and loyalty in using the technology. Strong commitment leads to loyalty which eventually will have a positive influence on service quality. Therefore, responsiveness in responding to cases of account hacking, responsibilities related to security systems and collateral for customer funds are very important. Moreover, banking sector is a public service that closely relates to trust and security. Therefore, the cases of account hacking becomes serious threat to the aspects of banking trust and security.

Internet banking applications must integrate a number of important security elements [9]. Therefore, the initial step that should be taken is risk identification regarding customer data security when using information technology for internet banking applications [34]. There are three security factors that must be regarded within internet banking security system including: (1) confidentiality (security), (2) integrity and (3) availability. Those aspects should be the main focus in the development of banking application system, besides the requirement to make the application system useful for customers. Internet banking technology should be useful and easy to operate and the same time secure in order to maintain the level of customer confidence [16]. With an increase in customer trust upon internet banking security, customers' cognitive awareness of the benefits of using internet banking will be increased as well.

4.2 The Influence of Trust on Attitude

Hypothesis 2 states that trust has a significant influence on users' attitude in using internet banking. Table 1 shows that the regression coefficient of trust on attitude is 0.222 with CR 2.129 (p = 0.033). With the significance level set at 0.05, CR table was found at1.96, showing that the calculated CR value is greater than the CR table, meaning that the regression coefficient is significant. It can be inferred from the data that the result of this research supports the view that trust shares a direct influence on attitude. Based on the research hypothesis H4, it is stated that a direct and significant influence exists between trust on users' attitude in using internet banking is accepted. This result supports the results of

research conducted by Lee and Baraghani supported by Gefen et al, which state that trust has a direct and significant influence on attitude within the TAM model [2,22,14].

In internet banking transactions, in which the bank has more information than customers, the bank can easily provide incomplete information or information that does not reflect the actual situation. To build long-term relationships with customers, banks should maintain good communication with customers to make them feel safe and put their trust in the bank as they can easily obtain the information they need from the bank. A web site can enhance the social communication through openness, responsiveness and quality of information to meet the needs of internet banking users [26].

All of five banks involved in this research have been known to focus on the aspects of convenience and security related to customer transaction data. Recognizing the importance of the role of IT, those five banks have implemented a new core banking system called iCONS (Integrated Centralized Online System) in all of their branches all over Indonesia. Furthermore, they have upgraded their infrastructure in the forms of new hardware and increased network capacity, allowing all branch offices to stay connected with the headquarters. They have also completed the establishment of Command Center and Disaster Recovery Site (DRS) facilities, in which two facilities play an important role in ensuring the stability of bank operations when problems occur in the main system. Branch office, the regional office and the head office are now interconnected using sophisticated communication facilities, namely a satellite transponder. This system facilitates money transactions, SWIFT transactions and Point of Sale transactions (Pos).

The iCONS system supports interconnection with other institutions, including policy makers such as the national payment system from Bank Indonesia to the Ministry of Finance, the National Clearing System (*SKN*), the National Black List System (*DHN*), the Intercity Clearing System and the State Revenue Module (*MPN*), fuel purchase system hosted by the OPBS with Pertamina, and many others. To accelerate the settlement process and improve bookkeeping accuracy, the banks have also implemented a Straight Through Processing (*RTD*) Real Time Gross Settlement (RGTS) system, automation of the credit clearing process and a new centralized Signature Verification System

The ICONS system also strongly supports banking transactions using Internet network regardless of time and place, making it easier for users to do various actions such as checking their balances, account to account fund transfer, bill payments and purchase of prepaid vouchers. The five banks have also implemented e-secure, an additional security tool for financial transactions in internet banking. E-secure or also called a token that functions to generate dynamic PIN every time a customer makes a financial transaction. One Customer ID only links to one serial number in e-secure, making it very unique and secure to use internet banking.

In addition to e-secure, the internet banking services provided by those banks have been equipped with the latest security methods such as the Secure Text Transfer Protocol (HTTPS) protocol, which transforms the data sent from server to ISP and client in the form of encrypted random data. The use of 128-bit Secure Socket Layer (SSL) encryption technology, from Verisign, with this SSL data transfer becomes required in SSL encryption on socket-level communication. Users' ID and PIN are used to log in this Internet Banking service, which session is limited by the time out session method, in which the access will be no longer valid if there is no activity that occur within 10 minutes.

The utilization of sophisticated hardware and software updates to enhance the data security will bring customers' trust in internet banking technology. Furthermore, higher customer confidence will affect their attitude in adopting internet banking technology.

4.3 The Influence of Trust on Users' Intention in Using Internet Banking

Hypothesis 3 states that trust has a significant influence on users' intention in using internet banking. Table 1 shows that the regression coefficient of the trust on intention was found at -0.008 and CR -0.066. The significance level was set at 0.05, obtaining CR table of 1.96 smaller than the CR table, indicating that the regression coefficient is insignificant. These results show that research data does not confirm the existence of direct influence of trust on intention. Based on the hypothesis of the study, H7 which states that there is a significant direct influence between trust on users' intention in using internet banking is rejected. But these results are not in accordance with the research AlSajjan and Baraghani, which result showed no direct influence of trust on intention [2,22].

A customer who uses internet banking should trust the service provider bank. When customers estimate the trust factor, one of the aspects that they consider is related to the ability of the electronic system to adjust to customer expectations [27]. Trust is enhanced when someone is sure about he ability and integrity of the other party [25]. Trust refers to the belief in something and the belief that the thing will bring goodness or profit.

Open information, information sharing, perceptions and feeling sharing and the involvement in decision making are factors that enhance the trust [27]. There are 11 conditions that can lead to trust, namely: discreteness, availability, competence, consistency, fairness, integrity, loyalty, openness, overall trust, promise of fulfillment, and and receptivity.

In the context of internet banking utilization, trust is a highly important element as it indicates whether customers will feel confident in doing their work and will get maximum results. Trust will determine if customer perceive the new information system technology can improve individual performance in carrying out the activities in organizations or companies. These individual, social and institutional factors influence customer trust in internet banking technology. Individual factors include age, gender, income level and level of education. The social factors that influence customers are the media, friends, relatives, family and colleagues. While institutional factors are places where the customer is educated or working and the government.

The results of this study show that trust does not influence customers' intention in using internet banking. These results provide empirical answer that trust has no significant influence on intention because individual, social and institutional factors influence customer trust in the adoption of internet banking technology. One's cognitive belief in the adoption of internet banking must be formed first. This indicates that the higher the cognitive trust towards internet banking, the higher the level of the trust. This insight supports the results of research stating that trust does not have any direct influence on interest, yet it delivers its influence through intervening variable that is cognitive beliefs which include attitudes, subjective norms, subjective behavioral control and perceived usefulness in using internet banking.

The most dominant factor that mediates customers 'trust in customers' interest in adopting internet banking is the perceived usefulness factor with a CR value of 5.646 using a significance level of 0.05 CR value of 1.960 table. The second factor is the perception of behavioral control with a CR value of 4.316. The third factor is the subjective norm factor with the value of CR 2.416 while the fourth factor is the attitude factor with the CR value of 2.129. These factors greatly influence customer confidence in the customer's interest in adopting internet banking.

4.4 The Influence of Perceived Usefulness on Attitude

Hypothesis 4 states that perceived usefulness has a significant influence on attitude in using internet banking. Table 1 shows that the regression coefficient was found at 0.136 and CR 2.410 ($p = 0.016$). The significance level was set at 0.05 obtaining CR table of 1.96, in which the calculated CR greater than the CR table, implying that the regression coefficient is significant .. These results support the view that the perceived usefulness directly has a direct influence on attitude. Based on the research hypothesis H12 stating that there is a direct significant influence of the perceived usefulness on users' attitude in using internet banking can be accepted. These results support the research findings obtained by Lee and Baraghani, which confirm the existence of a direct significant influence of perceived usefulness on attitude [2,22].

Perceived usefulness has a significant positive influence on customer attitudes in using internet banking. Attitude is influenced by the motivation to obtain certain benefits. Usefulness as a level where a person believes that the use of a particular subject can improve the work performance [8]. Internet improves the performance and gives broader information access. Data security and speed of transaction facilitated by internet banking offer more benefits to customers than other types of banking services. There are two benefits of Internet banking services for customers, the first benefit is that customers do not need to buy any software since all transactions occur within the bank's server [18]. The second benefit is that customers are able to access for banking services 24 hours regardless of time and places. Internet banking also provides many benefits to customers.

In addition, the perceived usefulness in internet banking refers to the benefit obtained by customers in completion of their jobs. An internet banking service will be highly useful if the service is easy and understandable and it

should facilitate interaction between customers and the banks. Thus, as a service provider, banks should introduce this feature to their customers directly. As an example, several banks in Indonesia handed out brochures for every customer containing easy-to-understand steps in using internet banking that customers can learn at home. In addition, 24-hour service is always available to help customers solving various questions about internet banking. Customers can take the benefits of internet banking as they are able to check their balances, transfer their fund, check the exchange rates and so forth directly via cellphone without having to spend much time and costs even in holiday.

Customers who perceive that internet banking is very useful to help them do financial transaction activities will also have positive attitude. Attitude which is an individual's general assessment of cognitive beliefs is shaped by some attributes inherent in technology. Perceived usefulness is a cognitive belief that forms attitudes. There is a positive influence between cognitive belief and attitude, implying that more positive belief will encourage more positive attitude towards internet banking. As the results, the level of internet banking benefit affects the attitudes and intention among customers towards the use of the internet banking service.

4.5 The Influence of Perceived Usefulness on Users' Intention in Using Internet Banking

Hypothesis 5 states that perceived usefulness has a significant effect on the intention to use internet banking. Table 1 shows that the regression coefficient of the perceived usefulness toward users' intention is 0.194 and CR is 2.182 ($p = 0.029$). The use of significance level at 0.05 has obtained CR table of 1.96, in which the calculated CR value is greater than the CR table. Thus, it can be implied that the regression coefficient is significant. Hence, the result of this research supports the belief that a direct and significant influence exists between the perceived usefulness on the intention in using internet banking. Therefore, hypothesis H13 which states that there is a direct significant influence between perceptions of perceived usefulness is accepted. This finding supports the ones found by Lee, Qureshi et al, and Baraghani, in which they found a direct significant influence between perceived usefulness on users' intention in using internet banking [2,22,29].

In this context, intention refers to customers' desire in adopting internet banking technology. The results of this study show that perceived benefit has a significant positive influence on customers' intention in using internet banking. Individual motivation is triggered by the intention to obtain benefits. The benefits gained from the use of internet banking include improved work performance and broader access to information. Perceived benefit has a strong influence on the use of internet banking. Technology utilization is closely related to users' attitude in utilizing the technology to complete certain tasks. Internet banking offers them benefit in carrying out their duties related to financial transactions which degree of usefulness can be measured by the utilization intensity, frequency of use, and the number of applications or software used.

The use of technology reflects individual's decision whether or not to use technology in completing a series of tasks. Ideally, in relation to compatibility of task-technology, the use of technology is measured by how much the proportion of customers choose to utilize internet banking technology. The operation reflects the user's decision to use technology based on user's evaluation of the suitability of technological tasks, making the use of technology takes place in a voluntary situation. The concept of utilization reflects individual's acceptance upon the system. Customers who perceive internet banking very useful to help them with financial transaction activities will also have higher cognitive belief. Perceive usefulness is a cognitive belief that influences one's intention in using internet banking. It can be inferred that that the more positive cognitive belief, the stronger users' intention to use the internet banking service system.

4.6 The Influence of Attitude on Intention in Using Internet Banking

The sixth hypothesis states that attitude has a significant influence on the intention to use internet banking. Table 1 shows that the regression coefficient of attitude on intention is 0.452 and CR 5.509 ($p = 0{,}000$) at a significance level of 0.05, in which CR table was found at 1.96, showing that the calculated CR value is greater than the CR table. It can be inferred from this result that the regression coefficient is significant.

The results of the analysis support the belief that attitude has a direct influence on the intention in using internet banking. Therefore,

the research hypothesis H1 which states that there is a direct significant influence of attitude on the users' intention to use internet banking is accepted.

This finding supports the results of research conducted by Chiou et al, Baraghani and Lee, which confirm the existence of direct influence of attitude on the intention in using internet banking [2,6,22]. On the contrary, this finding is contradictory to the results of research conducted by Davis, Ajzen and Fishbein, who found no significant influence between attitudes on intention in using the technology [1,8].

Positive attitudes of internet banking users can be enhanced by increasing customer value [35]. The value of the customer in this case refers to the ratio between the perceived usefulness of the customer and sacrifice that customers give to access the internet banking (perceived sacrifice). Whilst, customers' perceived usefulness involves two things, namely product attributes and service attributes. Product attributes are the benefits that customers obtain from certain products, which are generally a combination of functional attributes of certain products or services with features offered by the product or service. Service attributes include details of the services available on internet banking. While the sacrifice made by the customer (perceived usefulness) is a cost (perceived reasonable price) which includes transaction costs, product life cycle costs and risk. Transaction costs are costs that must be borne by the customer when they make transactions using internet banking. Product cycle costs are costs that must be paid during the life cycle of the transaction through internet banking. At last, risks are consequences that customers should deal with when they decide to use internet banking services.

The results of the study which state the influence of attitudes on intention to use internet banking indicate that customers' attitudes are variables that must be considered in the implementation of internet banking technology. Customers will use internet banking if they have positive feeling that the internet will make their jobs easier. It is almost certain that customers who believe in the positive benefits of internet banking will maintain this positive attitude as they keep using internet banking. Attitude that is formed by positive feelings upon internet banking will create loyal customers and this will certainly benefit the bank.

To generate positive feelings for customers about the use of internet banking, banks must create an effective promotional strategy using advertisements that continuously display positive benefits of the use of internet banking. Advertisement can be used effectively to build long-term images of certain products and companies and it can also trigger immediate purchases [33]. Advertisement is also employed to educate and build a brand's preferences. Using advertisement, awareness of certain product can be enhanced [19]. Thus, advertisement in the context of internet banking is rather indispensable in forming customers' positive feelings about the benefits of internet banking, through which positive attitudes and higher frequency in adopting internet banking technology are improved.

4.7 Research Findings

The findings of this research, which most coefficients are found significant indicate that the results provide strong support for most of the hypothesized influences. This research also confirms the suitability of TPB and TAM as appropriate models in explaining individual attitude in adopting internet banking. These results also support that the TPB and TAM models can be modified by involving trust as an intervening variable.

This research was conducted to propose an expansion of the model which involves trust and TAM model with TPB in a more comprehensive manner which simultaneously predict the acceptance of internet banking among users. This research combined TAM and TPB by putting into account environmental characteristics of Internet banking. This research also has verified that trust is one of the most important determinants in the adoption of internet banking technology. It can be inferred from this research that the theory of technology adoption and trust models can increase the customers' intention to adopt internet banking.

This study shows that acknowledging both technology adoption and trust model theories can increase customer interest in adopting internet banking. As for the details of the findings in this study which include the factors associated with internet banking adoption as follows:

1. The direct influence of attitude towards interest in using internet banking indicates that the variable attitude of customers of internet banking users is a variable that must be considered in the implementation of internet banking technology. Customers will use internet banking if the customer has a positive feeling that the internet will really

help his job. From these results, it can be seen that customers who believe that internet banking is positively beneficial will maintain a positive attitude by maintaining the use of internet banking. Attitudes that are formed due to positive feelings about internet banking will create loyal customers and this will certainly benefit the bank.

2. The findings of this study indicate that trust shows that trust has a direct effect on attitudes and perceived usefulness. The findings of this study also provide support that the TPB and TAM models can be modified by adding a trust variable as an intervening variable. Of course, the increased customer trust will affect the customer's attitude in adopting internet banking technology. The research finding which states that trust has a significant effect on the perceived usefulness of using internet banking is an important finding because in order for a technology to be perceived as useful, internet banking technology must be reliable in the security of customer transaction data.
3. Perceived usefulness have a strong influence on the use of internet banking. The use of technology is related to the behavior of using the technology to complete tasks. The use of internet banking is a benefit expected by customers in carrying out their duties related to financial transactions. Customers who have the perception that using internet banking is very beneficial in their financial transaction activities will increase their cognitive confidence. Perceived usefulness are cognitive beliefs that affect the interest in using internet banking. This means that the more positive cognitive confidence in the benefits of internet banking will affect customer interest in using the internet banking service system.

5 Conclusions, Implications, Limitation, and Recommendation of the Research

5.1 Conclusions

Based on the results of descriptive and inferential analyzes that have been carried out, conclusions can be drawn as answers to the problems and objectives that have been set, as follows:

1. Attitude has a significant effect on interest in using internet banking. This finding informs that customers will use internet banking if the customer has a positive feeling that the internet will actually help his job.
2. Trust has a significant effect on attitude to use internet banking. These findings inform that the implementation of hardware and software updates carried out by careful banks with the aim of data security for transactions carried out by customers in internet banking will generate customer confidence in internet banking technology with increased customer confidence will affect customer attitudes in adopting internet banking technology.
3. Trust has a significant effect on the intention to use internet banking. The findings of this study answer that empirically trust does not affect interest because these individual, social and institutional factors influence customer beliefs in the adoption of internet banking technology. When a customer adopts internet banking, his cognitive beliefs must be established first, meaning that the higher the customer's cognitive confidence in internet banking, the higher the level of trust.
4. Trust has a significant effect on perceived usefulness using internet banking. This finding informs that the understanding of internet banking technology, although useful and easy to operate, does not mean ignoring the value of security to maintain the level of customer confidence in the bank. These results prove that increasing customer confidence in internet banking security will increase customer cognitive awareness of the benefits of using internet banking.
5. Perceived usefulness has a significant effect on attitudes to using internet banking. This finding informs that the level of benefit of internet banking affects the attitudes and interests of each customer towards the use of the internet banking service system.
6. Perceived usefulness has a significant effect on the intention to use internet banking. This finding informs that the customer's decision to use technology is based on the results of his evaluation of the technology task suitability factor so that the use of technology takes place in a voluntary situation. The utilization concept reflects the individual's choice to accept the system, or system institutionalization. Customers who have the perception that using internet banking is very beneficial in their financial transaction activities will increase their cognitive confidence. This means that the

more positive cognitive belief in the benefits of internet banking has an effect on customer interest in using the internet banking service system.

5.2 Implications

This study examines the influence of the relationship between variables developed based on various thoughts, arguments and several theories. The results of this study are expected to implication to testing and clarification of the validity of these theories and consistency with previous studies. The theoretical implications in this research are as follows:

1. The results of this study also provide support that the TPB model can be modified by adding a trust variable as an intervening variable. The results of this study prove that TPB has the characteristics of both simple theory (parsimony) and is supported by data (verifiability) and can be applied in predicting the determinants of information technology adoption.
2. The results of this study provide confirmation of the suitability of the technology acceptance model theory which states that the behavior of using technology is initiated by the perception of perceived usefulness of a technology. The results of this study also provide support that the TAM model can be modified by adding a trust variable as an intervening variable. The results of this study prove that TAM has the characteristics of both simple theory (parsimony) and is supported by data (verifiability) and can be applied in predicting the determinants of information technology adoption.

This practical implication also applies to national banking institutions, especially banking institutions that have provided internet banking services. This study provides additional information regarding the factors that influence customers to receive internet banking services so that banks can better determine banking strategies and policies in the future. The results of this study indicate that most of the coefficients are significant and provide strong support for most of the hypothesized relationships. This study has verified that additional trust is one of the most important determinants of internet banking technology adoption. The results of this study indicate that acknowledging trust as intervening variables can increase customer interest in adopting internet banking. The success of internet banking adoption is determined by the perceived usefulness, the attitude factor, and the customer trust factor towards internet banking.

5.3 Limitations

This research and the obtained results have not yet been able to give thorough and holistic explanation of various problems related to the models of internet banking technology adoption in Indonesia due to the limitation within the researchers and obstacles that occurred during this research including:

1. The primary data of this study were obtained through a questionnaire which the choice of answers were made based on customers' perception. This perception-based assessment can experience a social desirability bias, which is a bias that arises as respondents provide answers that they consider appropriate or good based on their own personal measurement. Hence, the data might not precisely reflect the intended variables (Arnold and Feldman, 1981). This problem made it difficult for researchers to screen the truth and honesty of customers' responses based on actual circumstances and reality, even though the questionnaire cover letter provided information related to the secrecy of customers' data.
2. Although the number of samples in this study has fulfilled the SEM assumption, higher number of samples is still necessary in order to be able to generalize findings of this study to the actual model of customer adoption of internet banking in Indonesia.

5.4 Recommendations

1. Based on the above results, in the next study, new variables or indicators can be added to enrich the model used in this study. Thus, the results of subsequent studies can be more perfect and the conclusions obtained may differ or remain the same as the results of this study. If it is proven that the results are the same, it means that the internet banking technology adoption model used in this study has high consistency to be applied in Indonesia.
2. It is recommended that other researchers increase the number of research samples. Thus, the results of subsequent research can be more perfect and the conclusions obtained can more generalize about the actual adoption model of internet banking users in Indonesia.

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