

# E-BANKING ADOPTION ANALYSIS USING TECHNOLOGY ACCEPTANCE MODEL (TAM): EMPIRICAL STUDY OF BANK CUSTOMERS IN BEKASI CITY

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**Abstract.** The object of this research is customers on the five major banks in the city of Bekasi namely Bank Mandiri, BCA, BRI, Bank Danamon, and BNI. This study aimed to analyze the implementation of e-banking with the approach of Technology Acceptance Model (TAM). The research method is a survey method with a descriptive analysis and statistical analysis. The data is processed and analyzed by multiple linear regression statistical models using statistical software. The results of this study indicate that the person's ability to use computers, and interface design does not significantly influence perceived ease of use. Experience of computer use, relevance, security and privacy significantly influence the perceived ease of use. Relevance does not significantly influence the perception of its usefulness. Security and privacy, interface design, and perceived ease of use significantly influence the perception of its usefulness. Perceived ease of use significantly influences the attitude of its use. Perception of usefulness does not significantly influence the attitude of its use. Attitude for its use significantly influence the real usage and acceptance of e-banking.

**Keywords:** e-banking, technology acceptance model, customers

## 1. Introduction

E-Banking first appeared in the United States in the mid-1990s, in which financial institutions in the United States to introduce and promote e-banking to provide better banking services (Chan and Lu 2004). E-banking become one of the strategies used by the banking industry to compete. E-banking services provided by banks with the main purpose of providing convenience to customers. The measurement to determine how the implementation of e-banking in Bekasi City can be done using information technology adoption or known by the TAM approach. TAM was first introduced by Davis in 1989. TAM describes the relationship between the variables perceived usefulness and perceived easy-of-use, with a variable attitude, intention to use and usage behavior (Straub, Limayem, and Karahanna, 1995; Huang, D'Ambra and Bhalla, 2002). In the context of research in TAM, perceived usefulness and perceived easy-of-use also called confidence (beliefs) (Agarwal & Karahanna, 2000; Straub, Limayem, & Karahanna, 1995). During this time, the research using TAM is more focused on beliefs with some outcomes such as attitudes and usage, i.e, Venkatesh and Brown, (2001); Straub, Limayem, & Karahanna (1995). In this study, the model will include external variables that include variables of individual differences and system characteristic. The two variables used in the individual differences is computer self-efficacy and computer experience, while the variables that will be used for the system characteristic are variable relevance, security and privacy and screen design.

TAM was adapted from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) in Nugroho and Achjari (2004) by substituting the determinants of attitude with a set of sets consisting of two variables, namely perceived usefulness and perceived ease of use. Although both models (TRA and TAM) is able to predict the interests and usage of information technology with the satisfying, TAM are known to be simple and easy to use yet more powerful in modeling the determinants of user acceptance of computer technology (Nugroho and Didi Achjari, 2004). Hong, W, Thong, J.Y.L & Kar-Yan, T. (2002) proposed that the relevance of e-banking will enhance our customers' needs perception of usefulness.

The problem statement for this research are:

- Are individual differences influence perceived ease of use or easy-of-use (PEOU)?
- Are the system characteristics influence perception or perceived ease of use (PEOU) and perceived usefulness (PU)?
- Whether perception or perceived ease of use (PEOU) affects perception of its usefulness or perceived usefulness (PU)?
- Whether perception or perceived ease of use (PEOU) influence the attitude of the user (ATU)?
- Does the perception of usefulness or perceived usefulness (PU) affect the attitude of the user (ATU)?
- What is the attitude of its use or Attitude Toward Using (ATU) affect the acceptance of e-banking (ACC)?

## 2. Data and Research Model

The variables used in this study consisted of eight independent variables and one dependent variable. The independent variables are the computer self-efficacy (CSE), computer experience (CE), relevance (R), security and privacy (SP), screen design (SD), perceived ease of use (PEOU), perceived usefulness (PU), and attitude toward using (ATU) while the dependent variable is the acceptance of e-banking (ACC). Measurement of variables question on computer self-efficacy (CSE), computer experience (CE), relevance (R), security and privacy (SP), screen design (SD), perceived ease of use (PEOU), perceived usefulness (PU), and attitude toward using (ATU) uses Likert scale with 4 choice questions, which is a number 1 for strongly disagree option, the option number 2 for disagree, number 3 for the choice to agree, and number 4 for the choice could not agree more. As for the variable acceptance of e-banking (ACC) uses 7 digit range scale ranging from 1 for strongly disagree option to number 7 for strongly agree choice.

### 2.1. Research Model

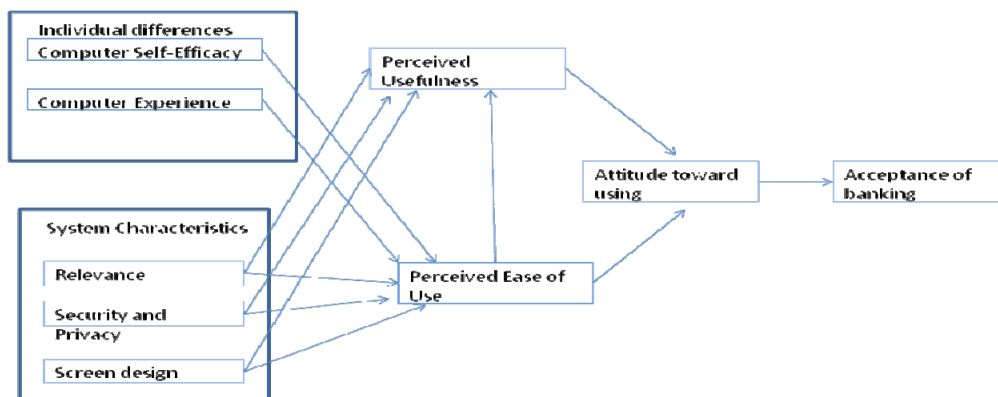


Fig. 1: Research Model

(Source: Hong et.al.2002 in Nugroho dan Didi Achjari)

### 2.2. Research Hypothesis

From the model above, the hypothesis that can be constructed are:

- H1a: Ability someone in using computers (Computer Self-Efficacy or CSE) will affect the perception of ease of use or perceived easy-of-use (PEOU)
- H1b: Experience over the use of computers (Computer Experience or CE) will affect perceived easy-of-use (PEOU)
- H2a : Relevant (Relevance or R) will affect perceived easy-of-use (PEOU)
- H2b : Relevant (Relevance or R) will affect the perception of its usefulness or perceived usefulness (PU)
- H2c : Security and Confidentiality (Security and Privacy, or SP) will affect perceived easy-of-use (PEOU)
- H2d: Security and Confidentiality (Security and Privacy, or SP) will affect the perception of its usefulness or perceived usefulness (PU)
- H2e: Design Interface (Screen Design or SD) will affect the perception of ease of use or perceived easy-of-use (PEOU)

- H2f: Design Interface (Screen Design or SD) will affect the perception of its usefulness or perceived usefulness (PU)
- H3 : Perceived ease of use or perceived easy-of-use (PEOU) will affect the perception of its usefulness or perceived usefulness (PU)
- H4 : Perceived ease of use or perceived easy-of-use (PEOU) will affect the attitude of the user or the Attitude Toward Using (ATU)
- H5 : Perception of usefulness or perceived usefulness (PU) will affect the attitude of the user or the Attitude Toward Using (ATU)
- H6: The attitude of the user or Attitude Toward Using (ATU) will affect the acceptance of e-banking

### **3. Result and Discussion**

#### **3.1. Factor Analysis**

Based on the results of factor analysis, it was found that all the variables used in this study, namely variable CSE, CE, R, SP, SD, PEOU, PU, ATU, and the ACC has a value of KMO MSA (Kaiser Meyer Olkin Measure of Sampling Adequacy) for more than 0.5 and significantly below 0.05, all factor loading was above the cut off point of 0.55, and on each of the questions in each variable grouped in one factor (Sarwono, 2006), which declared all these variables can be analyzed further.

From the test validity and reliability can be seen that all CSE variables, CE variables, R variables, SP variables, SD variables, PEOU variables, PU variables, and ATU variables have Cronbach's Alpha value of more than 0.60. ACC variables consisting of ACC1, ACC2, ACC3, ACC4, ACC5, and ACC6, only the ACC2, ACC3, ACC5, and ACC6 are valid.

#### **3.2. Hypothesis Analysis (Overall)**

The results for hypothesis 1a states that a person's ability in using computers (computer self-efficacy or CSE) does not significantly influence the perception of ease of use or perceived easy-of-use (PEOU). This proves that a person's ability in using computers is not always has a positive confidence against the ease of use. There are still other factors beyond the capability of a person in using computers, such as the existence of several applications or specific programs. Anyone maybe have the ability to use computers but he do not have desire use e-banking and also the factor of lack of ability in using other smart electronic devices such as mobile phones, ATM machines. The use of e-banking is not just limited to the use of computers, it is clear that people who have the ability in using the computer not always influence the ease of use of e-banking. This result is in line with Nugroho and Achjari (2004), but different from Wijayanti(2009) that there is significant relationship between computer self efficacy and perceived usefulness of internet banking. The result support Goh (1995), that if the technology infrastructure that supports are available, easily and quickly, then the e-banking applications are becoming more and easy to use.

Result for hypothesis 1b, proves the existence of significant influence of experience on the use of computers (Computer Experience or CE) on the perception of ease of use or Perceived easy-of-use (PEOU). This proves that the customer will evaluate e-banking easy to use if they have experience of computer use (PEOU). The experience on the use of computers owned by the customer, will make customers more easily in use e-banking. The longer the customer experience in using computers, it is increasingly easy for customers to use e-banking. Although the use of e-banking is not only use the computer, at least the customers already know how to use e-banking through the experience. In other words, customers who have experience on the use of computers will be easier in the use of e-banking, compared with customers who do not have experience on the use of computer. This result is the same as Yuadi (2009), that abilities and skills (including the experience of the use of computers) have an influence on perceived ease of use.

The conclusion for hypothesis 2a, show that there is significant relationship between the relevant (Relevance or R) on the perception of ease of use or Perceived easy-of-use (PEOU). This indicates that if the systems relevant, the information become relevant will make effect on ease of use of e-banking. By producing relevant information, the customers feel ease of using e-banking. The irrelevant information, will make the bank customers complain, which makes the use of e-banking become not easy. This condition will be complicated and spend more time-consuming job, customer have come to the bank or contact the service

center to lodge a complaint. This result support Yao (1995) that users tend to search for relevant documents handy. When an information technology contains a large amount of relevant information it will be easier for customers to find desired information. This result is different from Wijaya and Fahmy Radhi (2004) that relevance variable show a weak relevant to perceived easy of use.

For hypothesis 2b, this study shows that the relevant variables or Relevance (R) has no significant effect on perceptions of usefulness (PU). This may be due once the occurrence of errors such as information generated in the balance information which is if the information not relevant to the transaction, customers will feel aggrieved.

For hypothesis 2c, this study shows that the variables Security and Confidentiality (SP) has a significant effect on perceived ease of use (PEOU). This shows that the level of high security and confidentiality will make customers feel secure in the use of e-banking. If the safe condition is not met, then the customer will move on to other banks. A relatively frequent problem is the balance that is not appropriate, require the customer to take care of complaints to the bank.

For hypothesis 2d, the study showed that the variables Security and Confidentiality (SP) had no significant effect on perceptions of usefulness (PU). This indicates that the security and confidentiality in the use of e-banking is still doubted by the customer by the number of cases that occurred lately, such as ATM burglary, and balance discrepancy.

For hypothesis 2e, this study shows that the variable Interface Design (SD) had no significant influence on perceived ease of use or Perceived easy-of-use (PEOU). This shows that the probability of symbols, menus available are not easily understood by customers, or it could be the possibility of the customers who lack sufficient ability to understand the feature of e-banking. And may be caused by the customers' concentration whose open other websites at the same time. The customers assume that the display of the e-banking web site is too formal and rigid.

For 2f hypothesis, the results of this study indicate that variable Interface Design (SD) have a significant influence on the perception of its usefulness (PU). This shows that good screen design, made with full consideration would provide a useful benefit for customers. With the symbols, such as assistance (help) will help customers find it useful. Screen design that is attractive, capable of making customers comfortable, and easy to understand will make customers to feel the benefits in using e-banking.

For hypothesis 3, the results of this study indicate that the perception variables Perceived ease of use or easy-of-use (PEOU) significantly affects the perception of its usefulness (PU). This proves that the customer will view the benefits of e-banking is also based on ease of use of e-banking. In other words, customers will evaluate e-banking is helpful if they could use e-banking with ease. The ease of use of e-banking for example, not too many procedures to fill some forms, the simple language used can be understood easily by the customer, the customer will easily and quickly be able to feel benefit from the use of e-banking. Some benefits are the effective and efficient in terms of time, effort, and cost, and other benefits that can be perceived by customers.

For hypothesis 4, proves that this study show a significant effect between perceived ease of use (PEOU) of the attitude of the user (ATU). This suggests that simply the use of e-banking, making the customer intends to use e-banking. Due to the ease that is felt by customers in the use of e-banking, the customer intends to use e-banking that is expected to provide many benefits for customers. The ease of registration, ease of transactions, transfer funds, and other easiness which will provide benefits to customers so that customers do not have to waste time to visit the bank to transfer the funds. By making a transfer or transaction without having to visit the bank will relatively reduce the level of criminal risk, such as robbery because customers do not need to carry large enough cash in quantities that would cause risk to the customer as happened recently in Indonesia. Usually the customers intend to tell his friends to use e-banking services, for example the transfer of funds, although the transaction can only be made for customers who are both users of e-banking.

For hypothesis 5, the results of this study indicate that the variable perception of its usefulness (PU) is significantly has no effect on the attitude of the user (ATU). This suggests that the possibility of the absence of optimal benefit to be gained by customers, such as the existence of several mistakes made by the bank, or

difficulty of transaction process, which only impede the work or activity of the customers. Additional cost in the form of usage in e-banking transactions are also could make the customers not intended to use e-banking services.

For hypothesis 6, the results of this study indicate that the variables attitude to its use (ATU) significantly affects the real usage and Acceptance of E-Banking (ACC). This shows that the attitude or intention of its customers on the use of e-banking services cause e-banking service is received and used intensively by the customer. The acceptance and use of concrete made by customers is one kind of form of loyalty that they can give contribution to the bank.

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#### **5. References**

- [1] Agarwal, R., & Karahanna, E. 2000. Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS Quarterly*, 24(4): 665-694
- [2] Chan, S.C. and Lu, M., 2004. Understanding internet banking adoption and use behaviour: A Hongkong Perspective. *Journal of Global Information Management* (online journal from proquest), vol.12,Iss.3,pg.21.<http://proquest.umi.com/pqdweb?did=642433151&Fmt=4clientId=46969&RQT=309&VName=PQD> (2010, 11 April)
- [3] Goh, H.P. 1995. The Diffusion of internet in Singapore. Academic Exercise, Faculty of Business Administration, National University of Singapore
- [4] Hong, Weiyin, J.Y.L. Thong, W.M. Wong, dan K.Y. Tam. (2002). Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*. Winter 2001-2002, Vol. 18, No. 3, hal. 97-124.
- [5] Huang, W., D'Ambra, J., & Bhalla, V. 2002. An empirical investigation of the adoption of e-government in Australian citizens: Some unexpected research findings. *The Journal of Computer Information System*, 43(1): 15-22.
- [6] Nugroho, Enggar Hestu dan Didi Achjari. 2004. "Faktor-Faktor Penentu Penggunaan World Wide Web sebagai Sarana Pendukung Pendidikan: Studi Empirik Mahasiswa Akuntansi Di Yogyakarta". *Prosiding Seminar Nasional Aplikasi Teknologi Informasi 2004*. Yogyakarta: Universitas Gajah Mada.
- [7] Sarwono, Jonathan. 2006. *Analisis Data Penelitian Menggunakan SPSS*. Yogyakarta: Andi
- [8] Straub, D., M. Limayem, and E. Krahnna-Evaristo. 1995. "Measuring System Usage: Implications for Theory Testing, *Management Science*, 41:8, 1995, pp. 1328-1342.
- [9] Venkatesh, V., & Brown, S.A. 2001. A longitudinal investigation of personal computers in homes: Adoption determinants and emerging challengers. *MIS Quarterly*, 25(1): 71-102.
- [10] Wijaya dan Fahmy Radhi. 2004. "Pengaruh Perbedaan Individual dan Karakteristik Sistem terhadap Penerimaan Penggunaan Teknologi Informasi: Replikasi Model di Bidang E-Job Vacancies". *Jurnal Ekonomi & Bisnis Indonesia*, Vol. 19, No. 3, 2004, 269-281.
- [11] Wijayanti, Ratih. 2009. *Analisis Technology Acceptance Model (TAM) Terhadap Faktor-faktor yang Mempengaruhi Penerimaan nasabah Terhadap Layanan Internet Banking (Studi Empiris Terhadap Nasabah Bank Di Depok)*. Depok: Universitas Gunadarma.
- [12] Yao, Y.Y. 1995. Measuring retrieval effectiveness based on user preference of documents. *Journal of the American Society for Information Science*, 46(2): 133-145.
- [13] Yuadi, Imam. 2009. "Analisis Technology Acceptance Model terhadap Perpustakaan Digital dengan Structural Equation Modeling". Departemen Ilmu Informasi dan Perpustakaan. <http://palimpsest.fisip.unair.ac.id/images/pdf/imam.pdf>