

# Modelling End-User of Electronic-Government Service: The Role of Information quality, System Quality and Trust

Deden Witarsyah Jacob<sup>1</sup>, Mohd Farhan Md Fudzee<sup>2</sup>, Mohamad Aizi Salamat<sup>2</sup>, Shahreen Kasim<sup>2</sup>, Hairulnizam Mahdin<sup>2</sup>, Azizul Azhar Ramli<sup>2</sup>

<sup>1</sup>Department of Information Systems, Faculty of Industrial Engineering, Telkom University, Bandung, Indonesia

<sup>2</sup>Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia.

Corresponding author: farhan@uthm.edu.my

**Abstract.** Many governments around the world increasingly use internet technologies such as electronic government to provide public services. These services range from providing the most basic informational website to deploying sophisticated tools for managing interactions between government agencies and beyond government. Electronic government (e-government) aims to provide a more accurate, easily accessible, cost-effective and time saving for the community. In this study, we develop a new model of e-government adoption service by extending the Unified Theory of Acceptance and Use of Technology (UTAUT) through the incorporation of some variables such as System Quality, Information Quality and Trust. The model is then tested using a large-scale, multi-site survey research of 237 Indonesian citizens. This model will be validated by using Structural Equation Modeling (SEM). The result indicates that System Quality, Information Quality and Trust variables proven to effect user behavior. This study extends the current understanding on the influence of System Quality, Information Quality and Trust factors to researchers, practitioners, and policy makers.

## 1. Introduction

E-Government is designed as a place of occurrence of the process of interaction between the government and society, therefore the community plays a fairly important in the functioning of e-government. The success of e-government depends on people's desire to adopt and accept this innovation. But there are still many governments around the world are still facing the problem of low public willingness to use e-government services [1]. A survey conducted by the United Nations in 2014 [2] stated that the value EGDI (E-government Development Index) for the Indonesia region amounted to 0.25 and 0.50 and Indonesia are in middle the ranking.

The Waseda University Institute of e-government in 2013 also issued a press release containing the e-government ranking 55 countries worldwide [3]. In the press release, Indonesian's ranking the world number 40, decline 7 ranking from the previous year which stood at 33. Much of the country lagging behind other Southeast Asian countries such as Singapore that are in the first place, Malaysia was ranked 24 and Brunei Darussalam are is on the order to 31. This should be given serious attention



as to achieve MPE3I (Masterplan for the Acceleration and Expansion of Indonesian Economic Development), as ICT becomes one important component.

Realizing the benefits of e-government, the Indonesian government has issued a number of policies related to e-government [4]. The Government of the Republic of Indonesia issued Presidential Instruction No. 3 of 2003 on policies and national strategic development of e-government. Presidential Instruction as a guideline for all government agencies, both central government and local government in the implementation of e-government. It is expected there is a common understanding, the integration of all government agencies step in applying and developing e-government. Presidential Decree supplemented by the development of e-government Guidelines issued by the Ministry of Communications and Information Technology in 2003.

The Central Statistics Agency (BPS) in collaboration with the Association of Indonesian Internet Service Providers (APJII) [5] recorded a growth rate of Internet users in Indonesia by the end of 2013 had reached 71.19 million people. The survey was conducted in 78 districts / cities in 33 provinces of Indonesia. Based on the data, the growth rate of internet users has increased 13% from 2012 which recorded internet users amounted to 63 million people. Based on this fact, a study of the implementation of e-government in Indonesia is very important because the success of the implementation of e-government is not only dependent on government support, but also the public's willingness to accept and implement the service.

Voutinioti [6] stated that behavioral intention is the most important factor influencing citizens to adopt e-government, meanwhile trust also found to be a very influential factor. Lack of trust and confidentiality is a major barrier to e-government success [7, 8]. Meanwhile system and information quality include trust has developed in unmistakable quality in this period - the time of information technology, especially in the operation of e-government exchanges and managing conceivably a huge number of records of residents and clients. These records incorporate individual information and individuals' worries, intrigues, and their activities. Therefore, protection ruptures have turned out to be more basic. A considerable measure of exploration focuses conduct factual examination into wholesale fraud and extortion; these insights have recorded developed numbers in the course of recent years.

This paper presents an exploratory study on the e-government in Indonesia. It uses the Unified Theory of Acceptance and Use of Technology (UTAUT) with adding some variables such as information quality, system quality and trust. This model will be validated by using Structural Equation Modeling (SEM). This study is organized as follows; Section 2 describes the research problem. Section 3 describes related works on e-government. Section 4 describes research methodology. Section 5 describes the results and discussion. Finally, we conclude our work and highlight future direction related to this research in Section 6.

## 2. Research Problem

Al-Hujran et al [9] stated a confusion of e-government adoption, mainly about complicated and multidimensional issue. Base on crucial issue above, the study focused on the role of trust and privacy on e-government adoption, so the question of the research problem is what are the roles of perceived information quality, system quality and trust towards behavior intention in using e-government systems.

This paper goes for investigating "system quality, information quality and trust" in connection to utilization of e-government services. The specific objectives of the paper are to: first, explore the levels of trust, information quality and system quality of the current users of e-government services were related to the provision of e-services by government; and then the second one, investigate the relationship if any, between levels of variables and willingness to make use of e-government services and the develop a new model of e-government adoption.

### 3. Literature Review and Research Model

#### 3.1 E-government Adoption

The Numerous definitions are issued on the adoption of e-government, Al Awadhi characterizes e-government as the utilization of technology to enhance access and conveyance of e-government services to advantage the citizen and business sectors [10]. A few scholar states e-government as the utilization of information technology for example, Internet to support, simplify, and automate transactions between government and its constituents, businesses, and other governments [10,11]. At the moment, governments around the world try to make their online service. E-government services to be very important because it can reduce costs and improve service quality as compared to the traditional way. Furthermore, Jacob et al. [12, 13] stated that electronic government refers to how to apply the information and communication technologies (ICT) to improve the efficiency, effectiveness, transparency and responsibility of public governments. The study presented an application of rough set theory for clustering performance expectancy of e-government user. The propose technique base on the selection of the best clustering attribute where the maximum dependency of attribute in e-government data is used. The data sets are taken from a survey aimed to understand of the adoption issue in e-government service in Indonesia.

DeLone and McLean's opine that information system (IS) effectiveness should be measured based on system quality, information quality and service quality [14]. Furthermore, DeLone and McLean proposed redesigned a new model (Figure 1). Nevertheless, studies of e-government success and citizen satisfaction were less considered among researchers. More specifically, among the studies that applied D&M IS Success model in the e-government. Finally, E-government adoption and usage in developing countries will be explored to find the gap as a basic issue in this system.

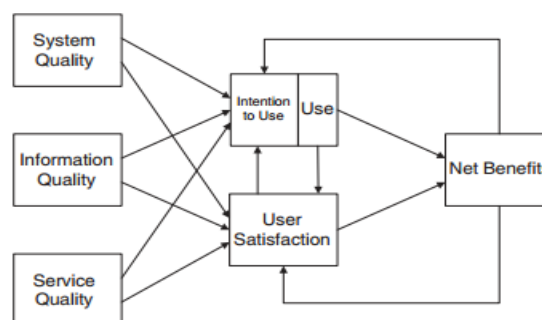


Figure 1: D&M IS Success Model

#### 3.2. Research Model and Hypothesis Development

Based on literature studies that have been done then developed a research model can be used to answer the research objectives. Factors of previous studies developed to complement the main model of the research. A basic model of this research is the model of acceptance UTAUT designed by Venkatesh et al. [15] which consists of four important variables such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Meanwhile, Witarsyah et al. [16] found critical factor that influences e-government adoption using comprehensive analysis based on the bibliometric technic. The study found a formulation of the conceptual framework on the basic of existing experience and their relationship. Then the basic model was extended based on previous literature.

##### 3.2.1 Behavioral Intention

Weerakkody [17] stated significantly influence behavioral positive to use behavior. In this work, the variable behavioral intention to have a positive relationship with the use behavior, in accordance with previous studies. This positive relationship indicates that the use of e-government system in the future

when available, will be influenced by a person's intention to use the system. Based on the above, the proposed research hypothesis as follows:

*Hypothesis 1: Behavioral intention to have a positive influence on people's behavior Use of e-government.*

### 3.2.2 Performance Expectancy

According to Venkatesh et al. [17] performance expectancy is the variable that most strongly affect a person's intention to use information systems. This study the variable performance expectancy has a positive relationship with the variable behavioral intention in accordance with previous studies. This positive relationship shows that the higher the level of a person's belief that the use of e-government system can improve their performance, the higher the person's intention to use the e-government. Based on the above, the proposed research hypothesis as follows:

*Hypothesis 2: Performance expectancy positively influences the behavioral intention public to e-government system.*

### 3.2.3 Effort Expectancy

This study suggests that the higher a person feels that e-government is easy to use and does not require great effort to use the higher the person's intention to use the system. This relationship is in accordance with previous studies which stated that the effort expectancy positively associated with behavioral intention [15], Based on the above, the proposed research hypothesis as follows:

*Hypothesis 3: Effort expectancy a positive influence on the increase in the public behavioral intention to use e-government.*

### 3.2.4 Social Influence

In his research, Venkatesh et al. [15] stated that social influence is significantly positive effect on behavioral intention. In this empirically state that gave the social influence positive influence on behavioral intention where the higher the public feel that the people around it deems important to think that he had receipts of e-government, it can increase the person's intentions weeks to use e-government. Based on the above, the proposed research hypothesis as follows:

*Hypothesis 4: Social influence a positive influence in improving citizen behavioral intention to use e-government system.*

### 3.2.5 Facilitating Conditions

In his research, some scholars stated that the Facilitating conditions significantly affect positive to use behavior [15,17]. In this study stated that facilitating condition a positive effect on the use behavior where the higher the citizen believes that the organization supports them to use e-government by providing a media information, it can assist them in using e-government to improve the use of e-government. Based on the information above, the proposed research hypothesis as follows:

*Hypothesis 5: Facilitating condition gives a positive influence on the use behavior of user to the use of e-government.*

### 3.2.6 Trust

Previous research has found that trust is an important component in improving customer satisfaction [29-18]. Given that e-government in Indonesia still in the developmental phase, a number of systems, protocols need to be standardized. Moreover, given that consideration will be the security and privacy is a major barrier to the use of the internet, then society will not communicate or interact using their

personal data without their trust. This study further emphasizes that trust affects the intention to use a service and directly affect behavioral intentions (behavioral intention). Based on the above, the proposed research hypothesis as follows:

*Hypothesis 6: Trust has a significant positive effect to the behavior intention in using e-government services.*

### 3.2.7 System Quality

In this study stated that the quality system is indirectly a positive influence on behavioral intention, if the system is running well, reliable, flexible, and can be integrated with other systems it will increase the confidence of citizens. Furthermore, e-government can help improve public kites. This is consistent with previous studies [24-19]. Based on the data above, the proposed research hypothesis as follows:

*Hypothesis 7: System quality to provide a positive influence on performance expectancy of e-government system.*

### 3.2.8 Information Quality

In this study stated that information quality is indirectly a positive influence on behavioral intention is to provide a positive relationship to performance expectancy, which, if the information provided e-government is very helpful assisting their performance. This is consistent with previous studies [19]. Based on the above, the proposed research hypothesis as follows:

*Hypothesis 8: Information quality has a positive effect on performance expectancy of the e-government system.*

## 4. Research Methodology

Research methodology takes a major place in a research development to ensure systematic and relevant research into the phenomenon under investigation. The concept of a theory is often regarded as a research methodology that includes the principles and an assumption of the hypotheses, in which the theory is based [20]. In particular, research methodology assists in a procedure and logic for generating the new knowledge of the current study, starting with literature study, hypothesis development, data collection, data analysis, finding hypothesis and reporting the findings and drawing conclusions (Figure 2).

In order to establish boundaries for constructs, a comprehensive review of the literature relating to the e-government domain was undertaken. In quantitative research, it is necessary to define operationally the variables. Accordingly, a total of one dependent variable and nine independent variables was formulated and defined operationally. The next stage undertaken in this study is to generate items that capture the domain as specified.

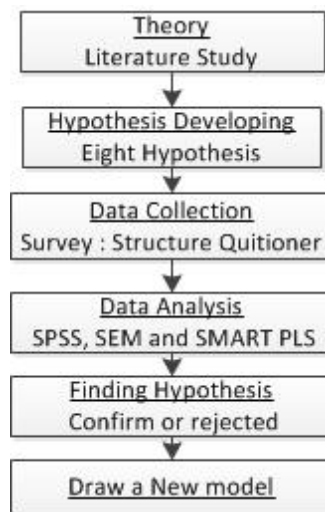


Figure 2. Research Methodology for the Current Study

## 5. Data Analysis and Result

The research model used in this study was constructed and analyzed using the Smart Partial Least Square (PLS) path modelling software package. The software allows one to graphically depict a PLS model and perform comprehensive statistical analysis.

### 5.1. Structural Model

The validity of research instruments shows the ability to measure correctly or exactly what is to be measured. According to Hair et.al. [20], a variable is said to have good validity of the constructs or latent variables, if  $t$  value of loading factor  $\geq 1.96$  and the load factor standards (standardize loading factor)  $\geq 0.50$ . Meanwhile, Hair et al. stated that the loading factor  $\geq 0.50$  standards is very significant. The recapitulation of the validity of the evaluation data by using software SMARTPLS 3.

Data processing is performed using multivariate structural equation modeling (SEM) based on the model of research that has been simplified as shown Figure 3.

Next to outer loadings, we have to explore the reliability outcomes to assess convergent validity. As mentioned in the previous chapter the most important reliability measures are  $R^2$ , Cronbach's alpha, Average variance extracted (AVE) and Composite reliability. The results are shown in Table 1.

Table 1. The Reliability Outcome

Variables	Cronbach's Alfa	AVE	CR	R square
Behavioral Intention	0.814	0.730	0.890	0.490
Effort Expectancy	0.790	0.703	0.876	
Facilitating Condition	0.865	0.595	0.898	
Information Quality	0.928	0.737	0.944	
Performance Expectancy	0.872	0.664	0.908	0.294
Social Influence	1.000	1.000	1.000	
System Quality	0.931	0.744	0.946	
Trust	0.883	0.809	0.927	
User Behavior	0.791	0.827	0.905	0.552



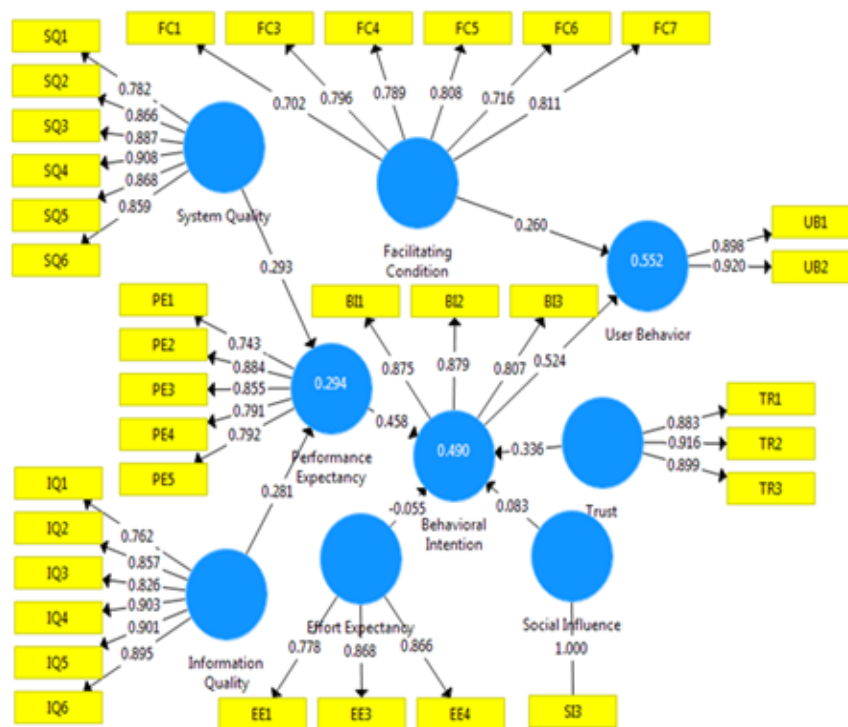


Figure 3. Multivariate Structural Equation Modeling

## 6. Discussion

Whether the positive or negative relations represent an adequate significant effect, can be determined after using bootstrap in Smart PLS. We measured these statistics as standardized as coefficients. According to the results from Table 2, two relations do not pass the significance test: Effort Expectancy→Behavioral Intention and Social Influence→Behavioral Intention. These relations reflect respectively H3 and H4, which can be rejected. The remaining coefficients all show positive relations in our model, which means that all other hypotheses are accepted.

Table 2. *t* Statistic Testing

	<i>t</i> Statistics ( O/STDEV )	<i>p</i> Values
Behavioral Intention -> User Behavior	5.584	0.000
Effort Expectancy -> Behavioral Intention	0.795	0.427
Facilitating Condition -> User Behavior	3.535	0.000
Information Quality -> Performance Expectancy	2.714	0.007
Performance Expectancy -> Behavioral Intention	6.171	0.000
Social Influence -> Behavioral Intention	1.570	0.117
System Quality -> Performance Expectancy	2.895	0.004
Trust -> Behavioral Intention	5.422	0.000

Based on the table 2 for *t* statistic testing obtained *t* value to the relationship between behavioral intention and use behavior of 5.584 which exceeds the value of 1.96 (at  $\alpha = 5\%$ ), then  $H_0$  rejected and  $H_1$  accepted that it can be concluded that the behavioral intention user can use a positive influence on

behavior citizen in the use of e-government. Next, the  $t$  value for relationship performance expectancy and behavioral intention of 6.171 which exceeds the value of 1.96 (at  $\alpha = 5\%$ ), then  $H_0$  rejected and  $H_1$  accepted that it can be concluded that the performance expectancy citizen can be a positive influence on behavioral intention citizen of the adoption of e-government.

Data processing obtained  $t$  value of the relationship between effort expectancy and behavioral intention amounted to 0,795 which is less than the value of 1.96 (at  $\alpha = 5\%$ ), then  $H_0$  and  $H_1$  rejected so that it can be concluded that the effort expectancy citizen does not have a positive influence on behavioral citizen intention in adopting e-government. Furthermore, for hypothesis 4, the result shows that  $t$  value for Social influence and behavioral intention amounted to 1,570 which is less than the value of 1.96 (at  $\alpha = 5\%$ ), then  $H_0$  and  $H_1$  rejected so that it can be concluded that the social influence citizen no positive effect on behavioral intention citizen in adopting e-government.

The result of data processing for hypothesis 6, 7 and 8 showed  $t$  value more than the value of 1.96 (at  $\alpha = 5\%$ ), then  $H_0$  rejected and  $H_1$  accepted. It can be concluded that the relationship has a positive effect on the use of citizen behavior in adopting e-government. These results are consistent with previous studies which stated that the facilitating condition influence positively to use behavior [15, 17].

## 7. Conclusion

This study found the behavioral intention, trust, system quality and information quality has a positive and significant impact on the performance expectancy (Table 3). Based on the result of the research, the three variables are very useful important factor in enhancing and guiding e-government adoption. Therefore the local city has to give more attention on this crucial factor. This study also gives good understanding on the role of trust and information system success model.

This study also has practical implication for practitioners, policy makers for the way in which people might increase their willingness to interact online. This study also gives a new perspective in order to enhance e government service to the community. Understanding adoption factors can extend the their knowledge of citizen, decision making, and lead better strategies. Finally, a new paradigm toward modeling factors was offered by the study. The model can guide the local government in enhancing links between the people and government.

Table 3. Summary of Hypothesis Result

No	Hypothesis Statements	Decision
<i>H1</i>	Behavioral Intention -> User Behavior	Accepted
<i>H2</i>	Performance Expectancy -> Behavioral Intention	Accepted
<i>H3</i>	Effort Expectancy -> Behavioral Intention	Rejected
<i>H4</i>	Social Influence -> Behavioral Intention	Rejected
<i>H5</i>	Facilitating Condition -> User Behavior	Accepted
<i>H6</i>	Trust -> Behavioral Intention	Accepted
<i>H7</i>	System Quality -> Performance Expectancy	Accepted
<i>H8</i>	Information Quality -> Performance Expectancy	Accepted

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