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The Critical Factors Affecting E-Government Adoption in Indonesia: A Conceptual Framework

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***Abstract*— Electronic government (E-Government) is the use of information and communication technology by the government to increase the service to citizens. E-government also could be applied to the legislative and judicative to improve internal efficiency of democratic governance. However, technological, governing and social issues have to tread carefully in order to adopt these phenomena. This study aims to find critical factor that influences e-government adoption. Furthermore, comprehensive analysis base on the bibliometric technic on various resources has been chosen to guide this work. Several dependent variables such as information quality, trust, and system quality also considered relevant were integrated with the unified theory of acceptance and use of technology (UTAUT) constructs as examining variables affecting the adoption of e-government. Finally, this study found a formulation of the conceptual framework on the basis of existing experience and their relationship.**

***Keywords*— e-government; services; bibliometric; UTAUT; adoption; conceptual framework**

I. INTRODUCTION

The development of technology is growing from time to time. This encourages a lot of changes in processes, functions, and policies in various business activities or in the public sector. Changes that occur in the public sector is marked by the development of electronic-government or e-government. There are four types of classifications, first, namely Citizens, Government (G-to-C), and the second one, namely Government to Business (G-to-B), Government to Government (G-to-G), and the last one namely Government to Employees (G-to-E) [1], [2].

G-to-C or G2C is an e-government application that is most common, here the government develops and implement a broad portfolio of information technology with the main objective to improve interaction with the public [3]. An example is the police building and offers services and driver's license or vehicle registration renewal through the internet with the intent to bring the administrative apparatus of the police to the community of vehicle owners and drivers so that the concerned does not have to bother to the office to obtain service [4].

G-to-B or G2B serves to connect the government with business circles. One of the main tasks of a company is forming a business environment conducive for the economy of a country can run well [5].

G-to-G or G2G refers to the need for the country to communicate with each other in a more intense by the day. The need for interaction between the government and the government every day is not only the range of things that smelled of diplomacy, but further to facilitate cooperation between the State, the public, industry, company, and others [6]. The last type is G-to-E or G2E. This type government intended to improve the performance and welfare of civil servants or government employees working in a number of institutions as a public servant [7], [8], [9]. Example applications are the system of government employee career development that besides aiming to assure their quality improvement of human resources, is required as well as supporting the process of movement, rotation, demotion, and promotion of all employees of the government.

Implementation of e-government in Indonesia is realized by the issuance of a presidential instruction No. 3 Year 2003 on national policy strategy for the development of e-government [10]. It contains measurement required under the duties, functions, and authority of each to the implementation of e-Government development nationally guided by the National Policy and Strategy Development of e-government, and formulate plan acts within their

respective agencies [10]. Likewise, implementation of e-government in Indonesia cannot be separated from the implementation plan in the form of a roadmap in accordance with Presidential Decree No. 3 of 2003. Indonesia geography islands offer a high level of diversity of population density, level of Internet access and awareness. E-government program in Indonesia should be designed as easy as possible so that from diverse communities can participate accessing e-government in Indonesia [10].

This paper points to the e-government as the utilize of information and communication technologies (ICT) to provide, first transparent services between government to citizens (G2C), second integrated service between government to businesses (G2B), and last one increase service between government employees to other government organizations (G2G).

The rest of this paper is arranged as follows: Section I explains about the introduction, and then Section II covers the adoption of e-government. Section III justifies the conceptual model of citizen e-government adoption and also brief very clear every subsection such as; Unified Theory of Acceptance and Use of Technology (UTAUT), trust, and DeLone and McLean Information System (D&M, IS) success model. Moreover, the final Section or section IV is the conclusion; this section provides a brief statement and the opportunity for future research.

II. Materials and Methods

E-government began as software for an internal government interaction. Furthermore, one of the functions of government at the moment provides the information through a website, and then increase the quality of service by developing online transactions. The impact is the interaction between government and citizens more reliable [11]. E-government plays a potential tool in order to improve the quality of culture, life value and the ways of conducting business [12]. Table 1 e-government defined by various last study.

TABLE I
E-Government Definition

Definition	Study
The purpose of e-government is to increase public service more accountable accessible, and effective.	[11]
A strategy to enhance access to the citizens, business, and intra-government through the use of technology.	[16]
Utilization of information technology in public administrations mixed with reformation bureaucracy and organizational.	[27]
The process of increasing better government service to the public.	[26]
Innovation with integrated e-administration and e-democracy to fulfil public satisfy.	[25]
E-government refers to a quick service to citizens, businesses, and society.	[26]
Provide citizens, business, and organizations with more convenient access to government information and services.	[16]
A strategy to increase citizen's participation and improve governance of a government.	[17]
A way for governments to improve the quality of the services and open opportunities to participate in democratic institutions.	[18]

The adoption of e-government is a very young field of research, and it is clear that not too much the literature review in an academic journal. Meanwhile, there is also lagging, refers to when the studies are written and when they are issued. Furthermore, sometimes there are no different between e-government adoption and internet adoption. So it's very important to verify how the subject has been addressed in the information systems literature.

In 2003, Davis and Venkatesh along with other researchers introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) that aims to explain the intentions of the user to use the IS and subsequent usage behavior [32], [36]. UTAUT models, unite eight theoretical models, namely the Theory of Reasoned Action (TRA), Technology Adoption Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization, Diffusion of Innovation Theory (DOI), and the Social Cognitive Theory (See Table 2).

TABLE II
The Theories Underlying The UTAUT Model

No	Theories	Definition
1	Theory of Reasoned Action (TRA) [29]	Theory to predict human behavior by analyzing the relationship between the various performance criteria and attitudes, intentions, and subjective norms.
2	Theory of Planned Behavior (TPB) [30]	A theory used to meet the situation when a person's behavior did not voluntarily enter the predictor intentions and behavior refers to beliefs about the existence of factors that can facilitate or hinder the performance of a particular behavior.
3	Technology Acceptance Model (TAM) [31]	A theory to identify reactions and one's perception that determines a person's attitudes and behavior by making a model of a person's behavior as a function of the manner by which the objectives determined by the attitudes behavioral objectives for such behavior.
4	Motivational Model (MM) [32]	The theory of motivation developed to predict the acceptance and use of technology.
5	Combined TAM and TPB (C-TAM-TPB) [32]	A hybrid model combined TPB and TAM to provide an accurate description of the behavior determinants of acceptance and use of a particular technology.
6	Model of Personal Computer Utilization (MPCU) [33]	A theory to assess the influence of conditions that affect and facilitate, social factors, complexity, compliance tasks and long-term consequences of the use of a PC.

7	Innovation Diffusion Theory (IDT) [34]	Adopted from the application of technology to measure public perception IDT using seven key attributes.
8	Social Cognitive Theory (SCT) [35]	A theory to identify human behavior as an interaction of personal factors, behavior, and environment which aims to provide a framework for understanding, predicting, and change human behavior.

After evaluating eight models, Venkatesh *et al.* [36] found seven construct that appears to be a direct determinant of significant behavioral intention or behavior in the use of one or more in each model. These constructs are performance expectancy, effort expectancy, social influence, facilitating conditions, attitude toward using technology, and self-efficacy. After going through further testing, they found four major constructs that play an important role as a direct determinant of behavioral intention and use behavior that performance expectancy, effort expectancy, social influence, facilitating conditions, while others are not as significant as the direct determinant of behavioral intention and use behavior. Besides, there are also four moderators: gender, age, voluntariness, and experience are positioned to moderate the impact of the four main constructs.

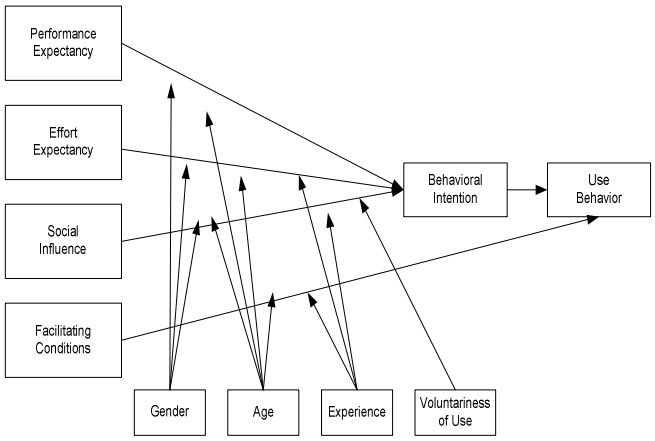

Fig. 1 UTAUT Model

A. Government Services

According to Fang [64], e-government provides different types of services and can be categorized into several types such as;

- Government to Citizen (G2C);
- Citizen to Government (C2G);
- Government to Business (G2B);
- Government to Government (G2G);
- Business to Government (B2G);
- Government to Non-Profit (G2N);
- Non-profit to Government (N2G);

Table 3 gives a definition for those of e-government services.

TABLE III
E-GOVERNMENT SERVICES

Types	Definition
Government-to-Citizen (G2C)	A system that is offering valuable information from the government side of their citizen
Citizen-to-Government (C2G)	A system offered from the citizen to the government, such as payment of bills and other valuable feedback
Government-to-Business (G2B)	A system that provides transactions and procurement facilities and calls for tenders.
Government-to-Government (G2G)	It is an initiative to provide the G to G or departments, cooperation, and communication online.
Business -to-Government (B2G)	An e-government service with mutual collaboration such as transactions online and e-procurement of goods.
Government-to-Non-profit (G2N)	An e-government system that provides information and communication to non-profit organizations, such as political parties and social organizations.
Non-profit-to-Government (N2G)	An e-government system that provides an exchange of information and communication between them.

B. Critical Success Factors (CSF)

Several researchers [37], [38] analyzed about the parts of CSF segments in e-government assignment research. They explored the genuine accomplishment varied for e-tendering structure. Their discoveries showed that the client's fulfilment, especially portrayed by seeing helpfulness and data accuracy were the most noteworthy elements affecting the goal to receive e-tendering framework. Meanwhile, trust is vital in online situations in light of the related danger [18].

Thusly, previous e-government examination has highlighted the centrality of trust as a determinant of a subject gathering of e-citizen driven associations, including the works [44], [45]. Next, the enormous issues in reception e-taxpayer driven organization are the crevice between what is offered and what is utilized; we call the "scaffold to accomplishment" of e-government appropriation. The government has been spending a ton of cash yet not get, the greater part of the estimation of this sort of framework. Along these lines, it is exceptionally dire to appreciate the elements that may impact e-government selection.

In this research, the authors use the bibliometric analysis. According to Norton, this technique can measure information and text. Bibliometric strategies have been utilized to follow back scholastic diary references. Meanwhile, according to Polanco [48], bibliometrics is a method of description, evaluation, and monitoring of research. It can describe the research surrounding a particular field, or similar; it can describe the quantity and focus of research output by a particular organization. As an evaluation method, it can help determine the impact of technology or the effectiveness of an author or research organization. Finally, it serves as a monitoring tool in that it can be used to track the level of activity in a research field over time.

Porter discusses so-called “tech mining,” the processing of text databases to extract meaningful information on technologies of interest [49]. As one example of tech mining,

he presents techniques for identifying and visualizing keyword interrelationships. Identifying these relationships requires a metric for term similarity; utilize co-citation information for this purpose, and use author collaborations.

Nevertheless, today bibliometric can be utilized to comprehend the past and even conceivably to conjecture what's to come. Kostoff clarified the utilization of bibliometric as a measure to evaluate research clout; he said that bibliometric investigates, sort out and break down a lot of recorded information helping scientists to distinguish "concealed examples" that may help specialists in the basic leadership process. Moreover, he extended the measure as an examining instrument recognizing development opportunities [13], [14]. Furthermore, Kostoff named the methodology as database tomography [15].

III. Results and Discussion

Based on literature studies before, next 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. The basic model of this research is an acceptance UTAUT model designed by Venkatesh *et al.*, Which consists of four important variables that performance expectancy, effort expectancy, social influence, and facilitating conditions.

In line with the aim of this study, the conceptual model proposed, seeks and adds a new dimension of satisfaction. Fig. 2 describes the model of the adoption base on the integrated two models The unified theory of acceptance and use of technology (UTAUT) and DeLone and McLean Information System (D&M, IS) success model by adding trust as free variable) [51], [52], [53], [54]. The next subsection informs clearly every dimension and variable.

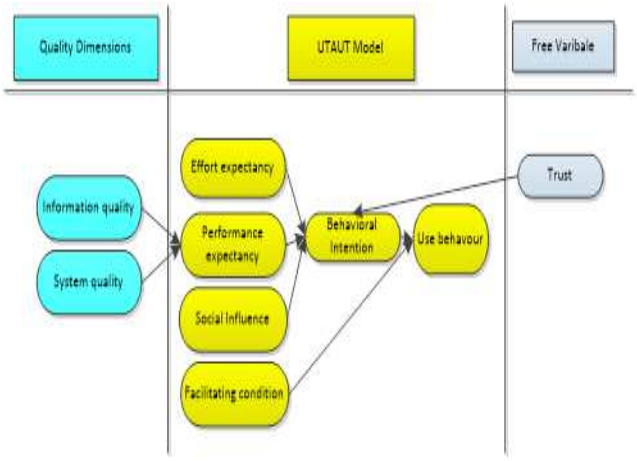

Fig. 2 Conceptual model of e-government adoption

A. Unified Theory of Acceptance and Use of Technology (UTAUT)

Model UTAUT has four constructs, which plays an important role as a direct determinant behavioral intention and use behavior, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions. These variables by Venkatesh *et al.* [36] have the following definition: (See Table 4)

TABLE IV
Definition of Core Direct Determinants of UTAUT Variables

Performance Expectancy	Performance expectancy is the degree **of** an individual believes that using the system will help him or her to attain gains in jobs.
Effort Expectancy	Effort expectancy is the extent of the perceived convenience of using the system.
Social Influence	Social Influence is the degree to which an individual perceives that other ones are important to him/her in using the new system.
Facilitating Conditions	Facilitating conditions refer to the extent to which an individual perceives technical and organizational infrastructure required to use the intended system are available.

B. Trust

A Trust and issues in governments have been found to be important factors for scholars (See Table 5). For example, Abu-Shanab *et al.* [45], Berdykhanova *et al.* [46], Faisal and Rahman [47].

TABLE V
Study on Trust

Dependent Variable	Independent Variable	Author
Trust in government	The schema of trust in the understanding of the use of e-government services .	[53]
Trust in government	Investigate the effect of information quality (IQ)	[52]
Trust in government	Transparency, effectiveness, and responsiveness of e-government services	[53]
Trust in government and internet technology.	Trust in Government	[58]
Intention to continue using.	Trust in government	[53]
Citizen trust	Citizen expectation, citizen satisfaction.	[54]
Trust in government.	Trust in using of e-government services.	[55]
Intention to use	A citizen trust model for e-government	[56]
Use of e-government transactional services.	Trust in the government.	[57]
Intention to use e-government services	Trust in transactional services	[58]
Trust in organization in online environment	Level of internet experience, organizational reputation, quality of previous online transaction experience, perceived website quality.	[59]
Attitude Toward Government 2.0	Trust of citizens in using e-government.	[60]
E-government services adoption	Responsiveness and satisfaction. Include service quality.	[61]
Intention to use	Disposition to trust	[62]
Intention to use the web	Impact of Percieved Usefulness, Ease of Use and Trust on Managers	[63]

They state that in the face of conflicting opinions, it needs clarity on the fact that trusts factor is important element of citizens in adopting e-government. This contention will be underpinned via Morgeson *et al.* [60] who posed that existing investigations that need managed in trust Also related issues with the connection from claiming e-commerce alternatively e-government need exited critical holes in the current understanding of the relationship of e-government.

Few scholars [61], [63] argue that crucial factor for any successful e-government adoption is trust. Table 4 presents summary explanation about trust in some past researches.

C. DeLone and McLean Information System (D&M, IS) Success Model

There is a big challenge for implementing IS success model in the public sector environment [51]. The success of e-government services depends on how citizens perceive its value. Individual characteristics, organization and technology have to consider to measure for a specific issue [52]. In this model describe that system quality refers to assess technical success, next, information quality refers to assess measures semantic success, and the user-satisfaction refers to assess customers' opinions. Finally, organizational impact refers to the system measured. Fig. 3 defines the D&M IS Success model.

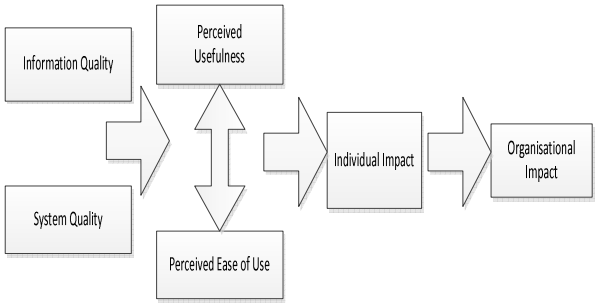

Fig. 3 D&M IS success model

D. Hypotheses Development and Variables Operationalization

At this stage of this section, describe formulated hypotheses to be used in this proposed mode and variables operationalization. The proposed model is created in a structural model; it has nine constructs; one dependent variable (use behavior or intention to use e-government systems) and eight independent variables such as information quality; system quality; performance expectancy (usefulness); effort expectancy (ease of use); trust and social influence. The clear hypotheses and variable operationalization explanation can be seen in the Fig. 4 and Table 6.

1) Behavioral Intention

On his the study, Weerakkody stated behavioral significantly positive effect on use behaviour. In this study the variable behavioral intention to have a positive relationship with the user behavior, in accordance with previous studies [40][41]. This positive relationship indicates that the use of e-government system in the future is influenced by one's intention to use the system. Based on the above, the proposed research hypothesis as follows:

Hypothesis 1: Behavioral Intention positive effect on people's behavior Use of e-government.

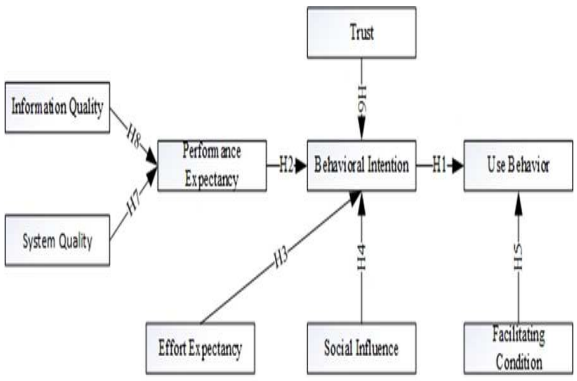

Fig. 4 Hypotheses based on the propose model

2) Performance Expectancy

According to Venkatesh [36] performance expectancy is the variable that most strongly affects a person's intention to use information systems. Variable performance expectancy has the 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) Effort Expectancy

In this study stated that the higher a person feels that e-government is easy to use and does not require great effort to use it, then the intention of people to use the system also higher. This relationship is in accordance with previous studies which stated that the effort expectancy positively associated with behavioral intention. Based on reason, the proposed research hypothesis as follows:

Hypothesis 3: Effort expectancy has a positive effect on improvement of community behavioral intention in using e-government.

4) Social influence

Venkatesh *et al.* States that social influence positive significantly affect the behavioral intention [36]. In this empirical state that gave the social influence positive influence on behavioral intention where the higher the public feel that the people around it deem important to think that he had receipts of e-government, it can increase the person's intention to use e-government. Based on the above, the proposed research hypothesis as follows:

Hypothesis 4: Social influence has a positive influence on improving the behavioral intention citizen in using e-government system.

5) Facilitating Conditions

Venkatesh *et al.*, Sambasivan *et al.*, Weerakkody *et al.* stated that the facilitating conditions significantly positive effect on the use behavior [40], [41]. They stated that facilitating condition had a positive effect on the usage behavior where the higher the citizen believes that the organization supports them to use e-government by providing a medium that can assist them in using e-government. Based on the reason the above, the proposed research hypothesis as follows:

Hypothesis 5: Facilitating condition has a positive influence on the behavior of citizen in using e-government.

6) Trust

Previous research has found that trust is an important component in improving customer satisfaction. Trust is a fundamental factor for the acceptance of a system by the user (citizen). Moreover, 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. Based on the data above, the proposed research hypothesis as follows:

Hypothesis 6: Trust has a significant positive effect Behavioral Intention in using e-government services.

7) System Quality

A few scholars stated that the system of quality indirectly has a positive influence on the behavioral intention [80]. The system also can give positive to performance expectancy if the system is running well, reliable, flexible, and can be integrated with other systems. Moreover, it will increase the confidence of citizens to use e-government. This is consistent with previous studies. Based on the above, the proposed research hypothesis as follows:

Hypothesis 7: System quality can positively affect performance expectancy of the e-government system.

8) Information Quality

In this study state that information quality is indirectly a positive influence on behavioral intention which to give a positive relationship to performance expectancy if the information provided can help the performance of citizen. This is consistent with previous studies [52]. Based on the work above, the proposed research hypothesis as follows:

Hypothesis 8: Information quality provides a positive influence on performance expectancy of the e-government system.

E. Variables Operationalization

Latent variables that had identified, but it could not be measured or assessed directly. Therefore, in this section will be the operationalization of these variables in order to obtain the manifest variables that can be used to assess the latent variables. This is manifest variables, which will then be used in the questionnaire to measure respondents' perceptions. The following is the operationalization of variables in this study.

Based on the above, the variable of a study can be grouped into operational research variables such as Table 6.

TABLE VI
VARIABLE OPERATIONALIZATION

Hypotheses	Contract	Operationalization
1	Behavioral intention	Behavioral intention cohesive prominently to use an e-government.
2	Performance expectancy	Performance expectancy is cohesive prominently to behavior intension to use an e-government.
3	Trust	Trust is cohesive prominently to behavior in tension.
4	Effort expectancy	Effort expectancy is cohesive prominently to behavioral intention to use an e-government.
5	Social influence	Social influence is cohesive prominently to behavior intension to use an e- government.
6	Facilitating condition	Facilitating condition is cohesive prominently to use behavior to use an e-government.
7	Information quality	Information quality is cohesive prominently to performance expectancy.
8	System quality	System quality is cohesive prominently to performance expectancy.

IV. CONCLUSIONS

The result of this study modifies UTAUT models by adding variable important variable such as trust, furthermore, the study proposed a conceptual model of e-government adoption in improving service to the citizen. The model will be used as a reference to establish further study in obtaining a better understanding on the issues of the e-government adoption. Summary of the hypotheses posit to develop relationships between various variable, as follows; 1) Behavior intention cohesive prominently to use behavior; 2) Performance expectancy is cohesive prominently to behavior in tension; 3) Trust is cohesive prominently to behavior in tension, 4. Effort expectancy is cohesive prominently to behavioral intention. 5. Social influence is cohesive prominently to behavior intension, 6. Facilitating condition is cohesive prominently to use behavior, 7. Information quality is cohesive prominently to performance expectancy, and the last, System quality is cohesive prominently to performance expectancy. Finally, the study irradiates the trust of e-government adoption as the importance of e-government adoption factor in effect of e-government in future.

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