

## A Conceptual Study on Generic End Users Adoption of e-Government Services

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**Abstract**— This study proposes a conceptual model for examining factors affecting e-government adoption in developing countries. It includes evaluating the existing adoption model studies of e-government adoption. Preexisting theoretical model and comprehensive analysis of the various resources was chosen to guide this work, and the result revealed that additional external factors were also important for explaining the e-government adoption in developing countries. Hence, external factors such as trust, national culture, knowledge of e-government services and DeLone and McLean information system (D&M IS) success model also considered relevant were integrated with the unified theory of acceptance and use of technology (UTAUT) constructs as examining factors affecting e-government adoption. Finally, this study finds a formulation of the conceptual model and their relationship with all variables for explaining e-government adoption through a systematic justification of the proposed integrated model.

**Keywords**— e-government; services; adoption; conceptual study

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### I. INTRODUCTION

The development of Information and Communication Technology (ICT) rapidly at this time have a significant impact on human life. This prompted a change in processes, functions, and policies in different sectors of human life be based on ICT, including public sector services. Changes in the public sector are characterized by the development of electronic government or so-called e-government [1].

E-government is designed as a place the process of interaction between government and society. Alawneh et al., Alharbi et al., and Hala [2], [3], [4] state that one important factor in the implementation of e-government services is the acceptance and the willingness of society to use e-government services.

Based on the information above, it can be seen that the community becomes an important part of the functioning of e-government, the interaction between the government and the community can work well if there is participation from the public. If there is no participation of the society in adopting e-government, it will not work and futile existence.

A few scholars state that more attention has been paid to e-government services adopted from the perspective of the “supply side” [4]. Meanwhile, just little the scholars have

even been explored for the citizen demand’s [5], and readiness [6]. The weakness of the studies above is they do not have a very good analysis, concept and strong foundation to provide a conceptual model of e-government service for developing country.

Fang has depicted e-government as a technique for governments to utilize the most inventive information technology, such as online web applications [7]. These applications can furnish the citizens and internal organizations with more helpful access to government, enhance good governance and give more chances to law based foundations and procedures, includes many issues, for example, trust, security, protection, openness, nature, mindfulness, and quality [7].

Past researches on the adoption of e-government have discussed several factors such as trust in government, trust in internet technology, utilization of e-government transactional service and others as a big issue in last five years [8], [9], [10], [11]. Based on the related works above, the authors justified that those factors have fundamentally proposed a better knowledge on different types of e-government service from several perspectives. Meanwhile, previous research on e-government adoption has mainly focused on the developed countries such as, study about the acceptance and use of government Internet services in

Netherland [25], user-centered e-government in practice in Belgium [68], Case study of factors affecting university instructors' adoption of web-based learning systems in Iran [69] and evaluation of government e-tax websites in Sweden [70]. Just a few discussed the adoption in developing countries such as study about e-government adoption in Cambodia [71], and assessing citizen adoption of e-government initiatives in Gambia [72]. In consequence, little attention was received to examine e-government adoption and use in the developing country in general.

Andresen stated the classification of the e-government evaluation approaches into three main streams [12]:

- *Financial methods.* Methods that has an output of financial character or which are expressing a financial condition. They assess the ICT investments' financial value by analyzing its cash in and out-flow and may assign arbitrary monetary values to non-economically measurable costs and benefits.
- *Quantitative methods.* They provide an output with one or several non-financial and quantitative measures when evaluating the ICT investment.
- *Qualitative methods.* They evaluate ICT investments by providing qualitative output (e.g. Critical success factors).

Watson and Mundy propose a model for e-government comprising initiation, infusion, and customization [13]. Symonds discusses four stages to e-government: one-way communications, two-way communications, exchanges, and portals [73]. It could be thought of as a more granular approach to stages of e-government than Watson and Mundy's model [14]. Both of these frameworks focus on the evolution of e-government systems through their respective stages. However, these models do not include the complex governmental relationships with a variety of constituents. Other models focus on the relationships rather than the stages.

In line with the aim of the study, where the problem statement is "how to formulate and investigate the e-government adoption and use e-government services", we try to examine factors affecting e-government adoption by drawing, extending and integrating the DeLone and McLean information system (D&M IS) with the Unified Theory of Acceptance and Use of Technology (UTAUT) [15], [16], [65], [66], [67]. Hence the result of this study is a conceptual model to solve the problem stated above.

The rest of this paper is organized as follows: Section II covers material and methods of adoption of e-government. Section III justifies the result and discussion include brief very clear every subsection such as; trust, D&M IS success model, national culture, and knowledge in e-government service. And the final section is the conclusion; this section provides a final statement and the opportunity for future research.

## II. MATERIAL AND METHODS

The worldwide acknowledgment of the Internet has yielded different ramifications for people in general part. Dissimilar to their customary blocks and mortar counterparts, government offices with on-line conveyance frameworks are non-various leveled, non-straight, and community in nature

and never shut. The intuitive nature of government gives advantages to both nationals and officials [17].

Governments across the world are grasping the digital transformation to broaden services for their citizens [18], [19]. Over the past decade, many governments throughout the world have built up their efforts to improve the efficiency of public services through ICT [15], and other e-government programs to gain considerable returns and/or savings [20].

Table 1. Refers to scholars that study about e-government adoption: (1) Moon et al. study about e-government adoption with city size perspective [21]; (2) Reddick et al. discuss about citizen demand [22], (3) Holden et al., explore the organizational structure of e-government adoption [23], Chartier and Cre study about geographic location [24] and (4) Reddick et al., focus on managerial, financial and technological capacity [25].

TABLE I  
STUDIES OF EXPLANATORY E-GOVERNMENT STUDIES

Determinants of e-government adoption	Authors
City size	[21]
Citizen demand (perceived usefulness)	[22]
Organizational structure	[23]
Geographic location	[24]
Managerial, financial and technological capacity	[25]

The major issues in adopting e-government service are the gap between what is offered and what is used; we call the "bridge to success" of e-government adoption. The government has been spending a lot of money, but not get all of the value of this kind of system. Therefore, it is urgent to comprehend the factors that might influence e-government adoption.

A couple scholars talked about the parts of critical success factor (CSF) in e-government investigates [26], [27], [28]. Then, Chu et al. examined the significant achievement elements of the e-procurement framework in Taiwan [29]. Their discoveries showed that the user's satisfaction, especially depicted by perceived usefulness and information precision were the most significant factors influencing the intention to adopt e-procurement system. Furthermore, Hwang et al. talked about a wide perspective of CSF and found that support for the government, lawful and assurance law, security, and unequivocal part and obligation of clients were a portion of the achievement components for e-government activities [30].

Lau tended to the achievement elements for building up the site of e-government and found that it relies on upon the elements, for example, site's data foundation, offices offered, correspondence outlet, and interface outline [31]. Meanwhile, Gil-Garcia overviews the achievement variables for state site usefulness in the USA [32]. The review outlined a model to explore the effect of hierarchical, institutional, statistic calculates on the part of e-government site, for example, the size of ICT firms, asset structure, specialized preparing, in-house development, subcontracting, and strategies for success were.

The precise and diachronic record of e-government selection boundaries, we present a method based on a

bibliometric investigation covering diverse sorts of sources (meeting procedures, diaries, articles, logical databases, examine notes, approach reports, and so forth.). In our approach, we took after the criteria proposed to guarantee consistency, thoroughness, and security of the discoveries [33]. Obviously, we are utilizing a moment arrange a sort of experimental confirmation and accept that the work delivered by researchers, decision makers, and professionals is a substantial and dependable intermediary of the socio-political and monetary procedures characterizing practically speaking the organization of e-government. Furthermore, with building on and expanding existing model of e-government suggested in the prior literature, a conceptual study is designed to recognize that the new model of e-government will have differing impacts when considering five different categories of variables. The sources utilized were Google Scholar and the propelled Google search motor, and catchphrases, such as;

- E-government.
- Electronic government.
- On-line government.
- E-government barriers.
- Adoption.
- Acceptance.
- Diffusion.
- Trust.
- Knowledge.
- Challenges.
- Opportunity.
- 12 National Culture.
- Critical success factor.
- Barriers.

We initially connected a more extensive determination basis, recognized articles specifically or in a way touching upon e-government, and in this way sifted them as to break down just those entirely focussing on boundaries and critical success factors.

### III. RESULT AND DISCUSSION

In line with the aim of this study, the conceptual model proposes, seeks and adds a new dimension of satisfaction. Fig. 1 describes and adoption model by integrating two models: the unified theory of acceptance and use of technology (UTAUT) and the DeLone and McLean Information System (D&M, IS) success model with additional variables such as, national culture, trust and knowledge of e-government service [34], [35].

The following section elaborates each of the dimensions and variables involved.

Proposed model (Fig. 1) is obtained from a deep literature review into e-government adoption literature, organizational culture, frameworks, and innovation. We consolidated and altered social measurements from Denison and Mishra [17], and Wallach [16] that are possibly important to represent government adoptions.

The model is created in view of hierarchical culture speculations that have advanced from the investigation of business associations and may along these lines have confinements in its appropriateness to an e-government environment. We mean to experimentally test the structure to investigate its legitimacy for administrative situations and to

look at for further social impacts and interdependencies that have not yet been distinguished. This system will take into account advance, inside and out an examination of the way of life measurements that impact on local e-government reception and utilize.

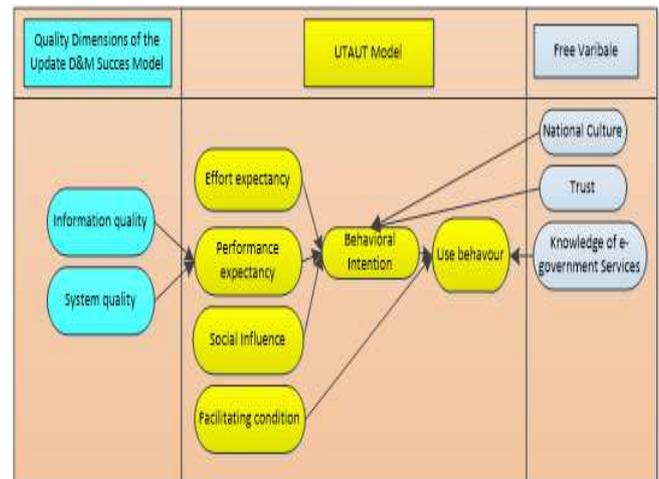


Fig. 1 Conceptual model of e-government adoption

#### A. Trust

Some scholars such as Alawneh et al., Alharbi et al., Alzaharani & Goodwin, Lee & Levy, Mäntymäki et Al., Mpinganjira, Nam, Yfantis et al., argue that crucial factor for any successful e-government adoption is trust [2], [3], [5], [10], [36], [37], [38]. Meanwhile, Mcknight et al. proposed a model of e-commerce customer trust where they posited that trusting beliefs leads to trusting intentions [40]. Others state trusts are truly related to loyalty [41]. See Table 2. the further explanation on trust in some past researches.

TABLE II  
STUDY ON TRUST AS DEPENDENT AND INDEPENDENT VARIABLE

Dependent Variable	Independent Variable	Reference
Trust in government	Trust on Technology	36
Intention to continue using.	Trust	37
Citizen trust	Expectation and Satisfaction.	38
Trust in government.	Trust on The Web	39
Intention to use	Emerging concepts in e-government reports	40
Utilization of e-government in transaction services.	Trust in the government.	41
Intention to use e-government services	E-participation	42
Trust in Organization in the Online Environment Internet	Website quality, Security, and confidence.	43
Attitude	Trust in technology use, political affiliation and socio-demographics.	44
Willingness to adopt e-government services	Service quality.	45
Intention to use	Trust in the internet	46
E-government websites	Trust in the internet	47

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

According to DeLone and McLean [34], technology and the individual characteristics have to consider to measure and construct a comprehensive measurement instrument for a particular context. The model describes that system quality refers to assess technical success. Next, information quality refers to assessing semantic success, and the user-satisfaction refers to assessing customers’ opinions. Finally, organizational impact refers to assess effectiveness success within the system measured. Fig 2. describes the D&M IS success model.

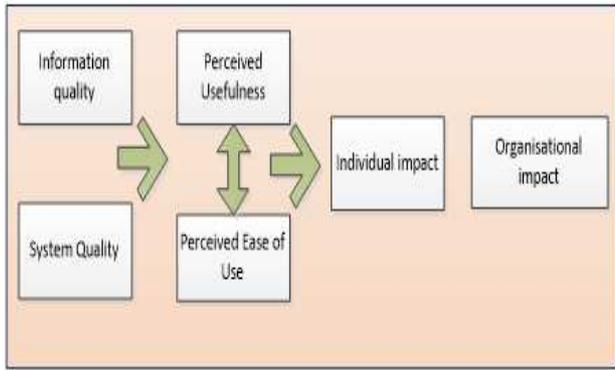


Fig. 2 D&M IS Success Model (DeLone and McLean, 1992)

**C. National Culture**

It is not easy to define the culture aspect of e-government adoption [49], [50]. Meanwhile, Hofstede [27] defines national culture as “the collective programming of the mind which distinguishes the members in one human group from another”. Hofstede’s measures and concepts were explored by most research including those who disagreed with his dimensions [5], [52].

Hofstede identified five dimensions of cultural variation. These dimensions have been conceptually defined as Table 3.

TABLE III  
DIMENSION OF CULTURE

Cultural variation	Dimensions
Power Distance (PD)	The extent to which the less powerful members of group or society accept and expect that power is unequally distributed
Uncertainty Avoidance (UA):	The extent to which the members of group or society feel threatened by unknown situations;
Individualism vs. Collectivism (IDV):	The extent to which individuals are integrated into groups;
Individualism vs. Collectivism (IDV) Masculinity vs. Femininity (MAS):	The extent to which gender roles are assigned in culture;
Long-Term vs. Short-Term Orientation (LTO):	Society's preference to be more forward looking or future oriented.

**D. Knowledge of e-Government Service**

Knowledge, in government service, is defined as a highly appreciated asset that may lead to more “intelligent”,

“competent”, “strategic”, or “smarter” forms of government [53]. Knowledge derives from previous actions and feedback, obtained through every step of the policy making a cycle with the purpose of improving management actions and focalizing policy targets.

In spite of these efforts, there is no clear conceptualization of knowledge for e-Government [54], [55]. In fact, most of the dimensions and types of knowledge presented in this paper mainly focus on the applications from the fields of organizational studies and knowledge management.

Arora describes e-government initiatives as large knowledge-intensive projects [55]. In spite of the recognition of knowledge is a critical factor for e-government adoption, few studies fully examine its dimensions. Meanwhile, Chang et al. [56] indicate that the success of a public organization depends on how effectively employees can collect, deposit, retrieve and share knowledge. Misra also points out that knowledge management in government is no longer a choice but an imperative [59].

**E. Hypothesis Development**

This section describes the formulation of hypotheses to be addressed. The clear hypotheses and explanation can be seen in the Fig. 3.

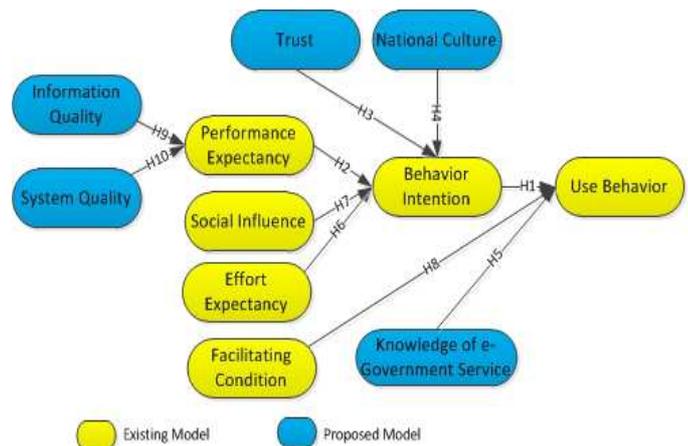


Fig. 3 Hypotheses Based on the Proposed Model

1) *Behavior Intention*: In the past study, Weerakkody stated that the behavior significantly positive effect on use behaviour [37]. Variable behavior intention to have a positive relationship with user behavior, according to previous studies [15], [16]. This positive relationship indicates that the use of e-government systems available in the future when a person is affected by the intention to use the system. Therefore, we propose the following hypotheses (H1):

H1 : Behavior intention cohesive prominently to use behavior of using an e-government.

2) *Performance Expectancy*: According to Venkatesh et al. performance expectancy is the variable that most strongly affects a person's intention to use the information system. In this study the variable performance expectancy has a positive relationship with the variable behavior intention in accordance with previous studies [35]. This positive relationship indicates that the higher the person's level of

confidence that the use of e-government system could improve their performance, the higher the person's intention to use the e-government. Hence, we suggest the following hypotheses (H2):

H2 : Performance expectancy is cohesive prominently to behavior intention in using an e-government.

3) *Trust*: This variable refers to the belief that one of the functions displayed an information technology. In the study conducted Mazlina and Fadi through the semi-structured interviews of information security management success factors and study the impact of perceived usefulness, ease of use and trust stated that the public would use the e-government system when the system is trustworthy [63], [64]. In this study state that trusts a positive influence on behavioural intention where the higher people feel that the system of e-government can be trusted, the higher its performance is also their intention to use them. Therefore, we propose the following hypotheses (H3):

H3 : Trust is cohesive prominently to behaviour intension in using an e-government.

4) *National Culture*: The culture is not an easy concept to define. In addition, there is no generally accepted definition of national culture. Hofstede defines national culture as “the collective programming of the mind which distinguishes the members in one human group from another” [27]. One of the dimensions is Uncertainty Avoidance (UA): the extent to which the members of the group or society feel threatened by unknown situations. Therefore, we suggest the following hypotheses (H4):

H4 : National culture is cohesive prominently to use behaviour intention in using an e-government.

5) *Knowledge of e-government services*: The knowledge of e-government is considered as an open source in which each public official access to other participants' expertise in the initiative [68]. Meanwhile, Information systems knowledge represents the knowledge and experience managing information and technological processing, collection, structure, and use within and across organizations [74]. Hence, we propose the following hypotheses (H5):

H5 : Knowledge of e-government service is cohesive prominently to use behaviour in using an e-government.

6) *Effort Expectancy*: Venkatesh [35] stated that the higher a person feels that the e-government system is easy to use and does not require great effort to use the higher the person's intention to use the system when it is available later. This relationship is in accordance with previous studies stating that the effort expectancy positively associated with behavior intention [15]. Therefore, we propose the following hypotheses (H6):

H6 : Effort expectancy is cohesive prominently to behavioural intention in using an e-government.

7) *Social Influence*: Some scholars [61], [62], [63] state that social influence significantly positive effect on behavior intention. The higher the perception of social influence, the

higher citizens are to be the use of e-government. Therefore, we propose the following hypotheses (H7):

H7 : Social influence is cohesive prominently to behavior intention in using an e- government

8) *Facilitating Condition*: Weerakkody [15] state that the facilitating conditions significantly affect posited to use behavior. *Therefore, we propose the following hypotheses (H8):*

H8 : Facilitating condition is cohesive prominently to use behavior in using e- government.

9) *Information Quality*: In this study state that information quality is indirect, a positive influence on behavior intention is to provide a positive to performance expectancy which if the information provided by the e-government is very helpful to them. This is consistent with previous studies [4], [26]. Therefore, we propose the following hypotheses (H9):

H9 : Information quality is cohesive prominently to performance expectancy in using an e-government.

10) *System Quality*: In this study stated that the system quality indirectly has a positive influence on behavior intention is to provide a positive to performance expectancy which if the system is running well, flexible, and can be integrated with other systems, it will increase the trust users that e-government can petrify improve their performance. This is consistent with previous studies [4], [26]. Therefore, we propose the following hypotheses (H10):

H10 : System quality is cohesive prominently to performance expectancy in using an e-government.

#### IV. CONCLUSIONS

The final result of this study modifies UTAUT models by integrating D&M IS success model (1992) with an additional major variable such as trust, knowledge of e-government service, and national culture. The model may be used as a reference to establish further study in obtaining a better understanding of the issues of e-government adoption.

Hypotheses in this study were developed to explore relationships between various variable, as follows; 1) Behavior intention is cohesive prominently to use behavior; 2) Performance expectancy is cohesive prominently to behavior intention; 3) Trust is cohesive prominently to behavior intention; 4) National culture is cohesive prominently to behavior intention; 5) Knowledge of e-government service is cohesive prominently to use behavior; 6) Effort expectancy is cohesive prominently to behavior intention; 7) Social influence is cohesive prominently to behavior intention; 8) Facilitating condition is cohesive prominently to use behavior; 9) Information quality is cohesive prominently to performance expectations, and lastly, system quality is cohesive prominently to performance expectancy. The study irradiates trust, national culture and knowledge of e-government adoption as the important factors of e-government adoption that may affect the e-government services in future.

The future investigation of this work collects the information to confirm all measurements and testing the hypotheses; the questionnaire will circulate to people who

comprehend e-government services. This work will utilize the quantitative way to deal with test the quality basic experimentally. To test the speculations, a procedure called Partial Least Squares (PLS) will be utilized in this review to confirm the way relationship.

The PLS strategy is a valuable other option to covariance-based Structural Equation Modelling (SEM), and it can be an effective technique for investigation because of the minimal demands regarding measurement scales, sample size, and residual distributions. After that, based on the theoretical and model proposed, a poll will be composed of eleven variables and 51 indicators. Utilizing PLS to check every one of the factors, quality of the model, correlation of latent variables, and structure model with coefficients. The consequence of this progression, the review will test the speculations in view of the model proposed.

Finally, in view of the outcomes, conclusions will be drawn on whether the model will be acknowledged or not. Besides, it will be examined which measurements influence the e-government services quality.

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