Factors Influencing the Adoption of E-Services in Malaysia

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ABSTRACT
In the 20th century, the information technology explosion that occurred globally has managed to influence and change the lifestyle of the world. In many developing countries, E-government initiatives are in their infancy stage. In Malaysia, e-services application is among five pilot projects under these initiatives that have been selected by the government to be implemented at the first phase. The success of this application is dependent on government support as well as citizens’ adoption of this application. This research will be identified the success factors (adoption factors) of the implementation of e-services in Malaysia and finally the ‘E-Services Adoption Model’ will be proposed. This model consists of 11 elements - cooperation, government commitment, culture awareness, legislative & policy, ICT infrastructure, leadership, user characteristic, web/system design, service quality, user satisfaction and user/intention behavior. Based on previous research exploring the determinants of the adoption of e-services using an amended version of the UTAUT model, the study reported in this paper investigates and identifies the factor that influences the successful of the adoption and implementation of e-services.

Terms: e-government, e-services, UTAUT, adoption success factors.

I. INTRODUCTION
In the 20th century now, the information technology explosion that occurred globally has managed to influence and change the lifestyle of the world. This includes changes in terms of education, research, communications and services that provided to consumers.

Based on the study of Palvia and Sharma [1], E-government refers to the delivery of national or local government information and services via the internet or other digital means to citizens or business or other governmental agencies. E-government is an important medium because it; (a) An initiative to improve the information flows and processes within government [2], (b) will increase accountability and transparency, less corruption, greater convenience, increased citizen involvement, greater efficiency, and cost reduction for government and user [3].

In addition, e-government has also provided significant benefits to all parties. According to Alsheri and Drew [4], the benefits resulting from e-government are likes; (a) Reduction of customers’ and organizations’ time, effort and costs, (b) improvement of service delivery and citizens’ satisfaction, (c) increase of users’ ICT skills, internet knowledge and computer usage and (d) creation of new business and work opportunities. That benefits received by all levels of society indirectly facilitate consumer adoption process of this electronic service system.

In Malaysia, e-government is also known as a public delivery system or e-services [5]. In general, e-service is an abbreviation for ‘electronic service’, which is a system of online services that can perform various transactions such as bill payments, job applications, license renewal, summons payment and many more. E-service is a system that change our conventional way of doing daily business to be more technology and can be solved just by our ‘fingertips’. In Malaysia, the explosion of information technology systems also affects the administration of an
organization in solving any particular task. The transformation process of e-services such as e-commerce, initially undertaken by corporate bodies and private companies, has now been fully implemented by the Malaysian government, in almost at all their agencies.

The main purpose of this paper is to propose the e-services adoption model in Malaysia. The development of this proposed model is based on data from a literature review, data from the discovery of the theory of the previous researchers and also from authors’ views.

II. LITERATURE REVIEW

Unified Theory of Acceptance Use of Technology

Unified Theory of Acceptance Use of Technology or UTAUT is a theoretical model used in information systems research. UTAUT resulting from research that carried out by Venkatesh in 2003. At this time, UTAUT has been validated and used in various fields in the English-speaking countries [6].

According to Venkatesh et al. [7], UTAUT is produced due difficulties for researchers to choose a variety of available models to use. Sometimes, there are researchers who choose models based on their 'favored model', this will cause most of the contributions in other alternative models has been negligible indirectly.

Basically, the UTAUT results from eight of the revised model, the Theory of Reasoned Action, the Technology Acceptance Model, the Motivational Model, the Theory of Planned Behavior, a model combining the Technology Acceptance Model and the Theory of Planned Behavior, the Model of PC Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory. In addition, the UTAUT also explained up to 70 percent of the variance has a desire to use technology, surpassing the previous model [7]. These include demographic factors that have been ignored in other models such as age and gender.

The UTAUT has four predictors of behavioral intention or usage - performance expectancy, effort expectancy, social influence and facilitating conditions. The predictors are defined as follows [7]:

Performance expectancy - "...the degree to which an individual believes that using the system will help him or her to attain gains in job performance."

Effort expectancy - "...the degree of ease associated with use of the system."

Social influence - "...the degree to which an individual perceives that important others believe he or she should use the new system."

Facilitating conditions - "...the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system."

Performance expectancy (PE) in the UTAUT model was derived from a combination of five similar constructs including perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations. Performance expectancy is the strongest predictor of intention within each of the individual models reviewed and was found significant at all points for both voluntary and mandatory settings in Venkatesh et al.'s [7] model-validation. In the UTAUT model also, effort expectancy (EE) captures the notions of perceived ease of use and complexity. In validation of the UTAUT, EE was significant in both voluntary and mandatory usage contexts, although only for the first period of usage. Since practice increases one's comfort with software, effort-oriented constructs logically would become less salient after learning hurdles are overcome [8].

Furthermore, according to Payne et al. [8], social influence includes consideration of the person's perception of the opinion of others, his or her reference group's subjective culture and specific interpersonal agreements with others, as well as the degree to which use of an innovation is perceived to enhance one's image or status in one's social system [7]. In their validation tests, Venkatesh et al. [7] found that social influence was not significant in voluntary contexts, but becomes important when use is mandated.

Another one is Facilitating conditions (FC) that represents organizational support, and includes the constructs of perceived behavioral control, facilitating conditions, and compatibility from prior models. Results from the UTAUT validation suggest that FC was significant in both voluntary and mandatory settings in the initial usage period, but its influence on usage intentions disappeared after this. Additionally, FC appears to be fully moderated by effort expectancy, such that, when both PE and EE
are present, FC becomes no significant in predicting intention [8].

**E-government**

E-government has been defined in many different ways from various studies, for example, Coleman [9] has defined e-government as a combination of service based on e-governance and e-democracy to achieve the objective of ‘balanced government’ [10]. Muir and Oppenheim [11] define e-government as one of the government ways to conveying information via the internet or digital methods [10]. Kumar et al. [12] also defines e-government as a medium for better service delivery to citizens, businesses and community members through a change in the way of government manages the information [10]. The full utilization of e-government will bring many benefits to government management and can bridge the interaction gap between government and citizens. This indirectly will involve citizens in making a decision or policy. This is because the government has been seen as complex, large bureaucratic organizations with a set of silos information that will erect barriers to access information and provide more complex services disappoint [9]. E-government can also give an impact in terms of cost savings to the government and citizens, increase transparency and reduce corruption activities in the delivery of public services. Previous studies of public service delivery categorize them into three groups: publishing, interacting and trading [12].

Recognizing the benefits provided by e-government, many governments around the world have been implementing the system as an effective delivery tool to citizens and stakeholders. According to Zhu and He [13], there is a paradigm shift when the government has been keen to use the internet in the course of daily work [10].

According to Heeks [14], the success of e-government can be divided into three categories: Total failure; Partial failure; and Success. Total failure refers to a situation when the initiative was never implemented, was implemented but abandoned or have been implemented but not met the goal. And success refers to (a) Largely Successful: Many groups of stakeholder achieve their goals and have not experienced with unwanted incident significantly, (b) Total success: All stakeholder groups achieve their goals and have not experienced with unwanted incident significantly, (c) Too early to evaluate: it is too early for evaluation as recently implemented or there is little empirical evidence to evaluate the results [10].

Build an adoption of e-government services should be thoroughly known before any adoption model is built. Many researchers have been given the goal to understand the initiatives that encourage the use of e-government services in various environments. These studies have shown that although different environments and have different features, there are public initiatives promoting e-government to be adopt by the citizens. However, there are certain environments have unique characteristics that can help to improve the use of e-government services.

As e-government services are mainly provided by using ICT, it is important to understand the information technology (IT) and how the adoption process has been done. This understanding should be extended to help us understand the use of e-government system. According to the Titah et al. [15], in most of the time, these theories have taken an approach in the form of the following: a diffusion approach, an adoption approach or a domestication approach [10]. In 1989, Napoli [16] and Castells had based their views on the Theory of Reasoned Action (TRA), Davis also has developed the Technology Acceptance Model (TAM) to explain how the user can adopt and then use the technology [17]. However, many researchers have used TAM to study the acceptance of technology. TAM has several features such as Perceived Usefulness - PU (the degree which a person believes by using a particular system can improve their task performance), Perceived Ease of Use - PE (the extent which the person believes by using a particular system would be free of effort) and Subjective Norm - SN (the perception where most people who are important to him think whether he should or should not perform the behavior) [10].

To explain briefly about the adoption of technology models, Venkatesh et al. [7] have extended TAM by produce the Unified Theory of Acceptance and Use of Technology (UTAUT) [10]. With the availability of UTAUT, it can help managers assess the possibility (probability) of success for new technology and understand towards
technology adoption. Next, the Theory of Diffusion of Innovations (DOI) seeks to analyze the characteristics of beneficiaries [16]. Other features are including image, compatibility, complexity, visibility, result demonstrability, and voluntariness of use of the Innovation. Wangpipatwong et al. [18] have explored the factors that influence e-government website on information systems and the quality system [10]. The results of his investigation, he finds that all the features are explored by the quality of information will affect the use of e-government websites and bring comfort to the user. 

Choudrie et al. [19] have been conducted a study on the developed countries, such as United Kingdom [10]. From their study, they found that people with broadband access at home is easier to adopt e-government and demographic factors such as age, sex, education and social class have an important role in creating awareness about the use of e-government at home.

The results of case studies from different countries find there are many challenges and issues that need to be resolved to ensure the successful implementation of e-government. There are various factors depending on the local context of any country. For example, Canada has been considered as the most advanced country in implementing e-government. This is because the Canadian government is committed to be the most connected government to the citizens [12]. However, some issues related to trust and usability sometimes has been an obstacle to the use of broadband in Canada.

In the proposed criteria for the e-government acceptance, Warkentin et al. [20] has proposed a conceptual model with public trust as a basic catalyst for the e-government adoption [10]. Besides that, Gilbert and Balestrini [21] suggest and test models based on attitude and quality of service [10]. From the literature review, it’s clearly show some frameworks have been using the Theory of Reasoned Action and, the Technology Acceptance Model has been used to explain user acceptance of the Internet. The study by Warkentin et al. [20] have proposed the perceived risk, perceived behavioral control, perceived usefulness and perceived ease of use [10]. It defines perceived risk as fear of loss personal information and the fear of being monitored on the internet. Through the proposed of conceptual model, if an individual can control their private information about how the information has been used and can be obtained, then, the use of e-government can be implemented. In addition, this model also explains the difference between acceptances by caste. The upper caste countries are more easily adopt e-government than people in the lower caste countries. The model produced by Gilbert and Balestrini [21] are more approach based on attitude and service quality. Among the aspects that present in this model are: first, the diffusion of Innovation theory where it is a way to understand the process through innovation such as Internet. The second one is, Technology Acceptance Model, which shows how consumers adopt and use new technologies [10].

There are some views from the researchers related to e-government. Warkentin et al. [20] described the acceptance of these services is like a citizen step to engage in e-government [10]. While, Gilbert and Balestrini [21] measure it as volunteerism to use e-government and, Carter and Belanger were measuring it as the intention to use e-government [10].

E-Services

In Malaysia, scheme or the e-service applications are among five pilot projects that have been selected by the government to be implemented at the first phase. The main objective of this project is to improve services access through various electronic delivery channels that are widely accessible to the public and also as a one-stop service center where various services can be obtained by all the delivery channels. Under this project scheme, citizens can achieve a simple and convenient service that offered by various departments or public agencies such as insurance and driving license renewal, summons payment, internet bills, and telephone or electricity payment at one place / center. And there also a provisions for a variety of electronic channels as a provider of services that are available through the internet, multimedia kiosks, IVR telephone and wireless devices with a facilities for payment by credit card, debit card or ATM card and also other payment modes. Therefore, citizens are provided with a various service delivery channels choices with 24 hours per day, 7 days per week. In other words, users no longer need to carry out transactions at agencies branches and utility offices, they may do so from anywhere according to their convenience. To
make it more user-friendly, multilingual facility for each access device was introduced. This project has resulted, other than a public convenience, there also a marked improvement in the delivery of public services. And this has encouraged users to be more responsive.

In terms of e-service, it is important to ensure that Malaysians use the provided applications. This is to avoid the government efforts that introduce e-service become useless and the main objective was not achieved. Therefore, we need to know and find out what factors will make user want to adopt and use this e-service. Without knowing the important of adoption factors and inhibitor factors for e-services, service providers, such as departments or public agencies may use the resources and energy/effort that limited them on matters that less importance in which may have less contributed to the successful implementation of e-service. Otherwise, if all these factors can be identified, the existing key resources can be channeled to further improvement of e-service system.

III. ADOPTION SUCCESS FACTORS OF E-SERVICES

From the research results obtained, from time to time, there are many factors contribute to the success of e-services. These success factors indirectly catalyze the use of e-services among Malaysians.

The main success factors of e-services depend on the level of efficiency of this system. According to Kaliannan and Halimah [22], e-service system, will indirectly involve the use of Internet and wireless communication technology. This will allows people to access e-government services regardless of time, either on a weekdays or public holiday, in other words, 24 hours/7 days a week/365 days a year. Moreover, according to Abhichandani and Horan [23], the efficiency of the e-service system enables information to be accessed efficiently with minimal effort by the end user.

The second success factor is Information Communication Technology. To achieve online services efficiently and effectively, the quality of public service delivery through the use of ICT and multimedia should be prioritized [22]. Infrastructure such as the Internet is one of the important medium to achieve a better government [24]. According to Pudjianto and Hangjung [25], top management has a great power to influence subordinates behavior in the organization. This will indirectly help expedite the adoption of e-service systems among citizens.

There are also factors by categories that contribute to the success of e-government. Among the factors are customer, citizen, government, information, network, organization, system web, trust, co-operation and user. Here are listed in more detail all the factors which are customer loyalty [26], customer satisfaction [27], citizen demand and citizen trust [27], government enforcement and government transformation [25], government policy [28], government transparency [22], information quality [29], information security and information sharing [30], network infrastructure and networking policy [31], organization mission, vision, objective and strategy [32], organization responsiveness [33], system compatibility [24], system quality [29], system reliability [33], system security [34], web interactive and web presence [35], web navigability and web usability [36], trust in e-government and system [37], trust in organizational [22], co-operation among citizen [38], co-operation between organization [22], user adoption [39], user characteristic [40], user experience [23], user friendly of system [10] and also user loyalty [26].

In addition, other factors such as perceived behavioral control, perceived ease of use, perceived risk and perceived usefulness also contributed to the success of e-service systems. For example, perceived ease of use refer to which people believe, by use the e-government, they are able to perform any transactions easily, while perceived usefulness, according to Alomari [33] was defined as the extent to which people believe by using e-government, it can help to increase the revenue or government transactions. In addition, Ajzen [41] state that perceived behavioral control reflects to beliefs about how to get resources and opportunities to perform the behavior. While the perceived risk defined as fear of the losing personal information and the fear of being monitored on the internet [12], [42].

Several other adoption success factors of e-services were also mentioned in several journals written by previous researchers such as service quality [10], [26], [33], [43]; effective and efficient [44]; website design [10], [23], [45]; ICT expertise and ICT infrastructure [25] and also social influence [36], [46]. Other factors that also influence the
adoption and the success of e-services are technological infrastructure [24], [31]; use of computer and internet [28], [40]; staffing and skills [30]; user satisfaction [28], [47] and time flexible [31], [44].

In addition, the single factor that contributes to e-government success is as follows: ICT training for citizen [24], awareness campaign by government [27], e-government promotion [48], influences to use e-government [24], behavioural intention [41], bridging the digital divide [46], bureaucratic [49], personalization and customization [23], political [49] and yet, privacy and confidentiality [39].

In conclusion, all the success factors above are the catalyst for e-services development. The successful of existing systems, has give people a confidence to try, thus implementing e-services system in everyday affairs.

IV. CONCLUSION

Based on the research findings (which is after the analysis was performed on the data from a literature review), theoretical discovery of other researchers and the authors’ views, the adoption model of e-services has been developed (refer to Figure 1). Thus, the complete adoption model of e-services in this paper is proposing incorporates all the attributes found in the earlier models and also the data that found in the literature review.

![Diagram of E-Services Adoption Model](http://www.egov4dev.org/success/sfdefinitions.shtml)

**Figure 1: E-Services Adoption Model**

The model consists of 11 elements. And all these elements are the adoption success factors for the e-services. It is believed that incorporation of these elements of the model into the design of e-services would make the system of e-services more successful, productive and effective. These elements are also universal where they are also suitable to be implemented on any e-services system for any other institutions or public agencies.

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