

Impact of Internet Experience on Citizens' Adoption of E-Government in Sri Lanka

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Abstract: Electronic Government implementation and adoption of its services are in early stage in many developing countries. The fruitful outcome of this effort not only depends on the government side but also the citizen's side as well. This study amended and used Unified Theory of Acceptance and Use of Technology (UTAUT) model to identify the factors influencing citizens' adoption of electronic government and moderating effect of citizens' internet experience. University students from Sri Lanka were the participants of the study. The real data disclosed that factors such as performance expectancy, effort expectancy and social influence determine the participants' behavioural intention to use electronic government services, and these factors are influenced by the participants' internet experience.

Keywords: Electronic Government, Citizens' Adoption, UTAUT, Internet Experience

Introduction

Information Technology (IT) has interwoven itself with almost all activities of human life today and it has many benefits, opportunities and challenges for managers and policy makers in private as well as public sectors. After the invention of the Internet by the Department of Defense in the US as a communication network, the Internet has now become part of the daily life of people worldwide. As a result, the number of internet users today is estimated to be around 2,405,518,376 (Internet World Stats, 2013).

Governments around the world have been increasing investments in electronic services during

the recent decades and have included the potential of online resources to improve the services to their citizens and increased their competitive advantages. The success of such initiatives by the governments largely depends on the higher adoption of such services by their citizens. The delivery of government information and services by using the ICT is commonly referred to as Electronic Government (e-Government) (Akmanet *al.*, 2005; Karunasena *et al.*, 2011).

E-Government enables citizens to access information efficiently and also has improved the transparency and communication of government information. The diffusion of this innovation is normally attained with much cost for the implementing side; the government but researchers have found that most countries suffer with low satisfaction in the citizens' adoption of e-government services. Research works studying the citizens' adoption of e-Government are less for developing countries (AlAwadhi and Morris, 2008) and this research is aimed to fill this gap in Sri Lankan context where e-Government services are being built. The Unified Theory of Acceptance and Use of Technology (UTAUT) model is adopted in this study to explore the factors that determine the adoption of e-Government services in Sri Lanka. The results of this study will be helpful for policy makers to understand citizens' adoption of e-Government services.

E-Government in Sri Lanka

The launching of Lanka Gate, the official portal (www.lk or srilanka.lk) of Sri Lanka, on the Internet

was the implementation step of the e-Srilanka project by the Government of Sri Lanka. Using the site, citizens are enabled to obtain more than 20 e-Services such as e-Revenue License Issuance, Issuance of Examination Certificates, etc. (Lanka Gate, 2013) and updated information from the government agencies.

Sri Lankan government started the e-Srilanka project in 2002 (Karunasena *et al.*, 2011) and has been continuing to bring in all services of government agencies under one portal. The e-Srilanka project carries many significant benefits such as quality public services, reduction of communication and information costs, bridging the digital divide, and getting the citizens actively participating in government (Jaeger and Thompson, 2003; Akman *et al.*, 2005; Karunasena *et al.*, 2011) to the citizen of Sri Lanka. The Government Organizations Visitors Survey of ICTA (2011) identifies the following as the benefits for citizens of Sri Lanka:

- Reducing Burden: administrative simplification; providing higher valued and faster services; saving time and money and improving equity
- Increasing User Satisfaction: 24/7 service; improving personalization and service quality; improving access and equity; addressing security and privacy concerns; transparency and choice
- Supporting Growth: improving the business environment; creating an information society; establishing an infrastructure for secure and reliable transactions

The Computer Literacy Survey (CLS) – 2009, which is the latest statistics available as of January 2013, of the Department of Census and Population of Sri Lanka (DCPSL) states that there has been improvement in the household ownership of computers in Sri Lanka from the year 2004 - 2009. The CLS mentioned that *at least one computer is available in one out of every ten households on average in Sri Lanka*. This shows that the usage of computers by the citizen is increasing continuously which is a good sign that the usage of e-Government services by citizen may increase.

In addition to the increase in the household ownership of computers in Sri Lanka, it can be seen from the survey done by the DCPSL that the Computer Literacy (“*if a person could use computer on his or her own, he or she is considered as a computer literate person*” (CLS, 2009)) of Sri Lankan citizen as of year 2009 is 20.3% which was 16.1% in the year 2006/2007 period; this gives us a hint that a good amount of the citizens of this country could adopt e-Government services in Sri Lanka.

According to UN E-Government Survey 2012, Asian countries continue expanding e-Government services by making investments to expand infrastructure, including support for broadband and mobile access. In 2012, out of the top 20 world e-government leaders, three are from Asia; Republic of Korea, Singapore, and Japan. Regionally compared, Asia as a whole has a higher level of e-Government than the rest of the world.

In 2012, Sri Lanka secured 115th place in World e-Government Development Ranking, but it was in 111th place in the year 2010 (UN E-Government Survey, 2012), though Sri Lanka performs better than some other big countries in the region.

Sri Lanka which had been under the bad hands of three decade old civil war was successfully rescued recently and is trying to regain the lost time and opportunities by embarking on comprehensive development roadmaps; the most recent one is the ‘MahindaChinthana’; the strategic plan of His Excellency The President MahindaRajapaksha, which places greater emphasis on rural development. ICT has formed an integral and increasingly prominent part of these national plans.

Among Southern Asian countries, Sri Lanka is in 3rd place for the last six years but as for the global rank, the country’s position is decreasing continuously meanwhile this is in contrary to the number of Internet users in the country. Internet World Stats (2013) cited based on International Telecommunication Union’s *Internet Usage and Population Statistics*, Internet users in Sri Lanka was 428,000 in the year 2007 and it grew to 1,776,200 in 2010 and Internet World Stats’ (2013) the *Asia Internet Use, Population Data and Facebook Statistics* mentioned that Internet users in Sri Lanka on

30th June 2012 was 3,222,200 and Facebook users were 1,515,720 on 31st December 2012, which is a gradual increase during the years and LinkedIn claims that there are more than 500,000 users using it in Sri Lanka; but on contrary to the number of Internet users, it is a shocking fact that the number of users who have registered on www.srilanka.lk, the e-Government portal of Sri Lanka, is 19,502 as of 02nd of April 2013. The government of Sri Lanka has a political will for successfully implementing e-Government in Sri Lanka; this is implied by the efforts taken by the Sri Lankan government. Therefore, all the efforts taken by the government are yet to yield significant results for the development of e-Government in Sri Lanka.

There have been a number of studies which try to identify the citizens' adoption of e-government in developed countries but studies that try to identify the adoption factors in developing countries are a few (AlShihi, 2005). After a good review of published researches on citizens' adoption of e-Government, it is found that there aren't any researches that study the citizens' adoption e-Government in Sri Lankan context available. Therefore, there exists an unfilled gap in the research work that tries to identify the factors influencing the citizens' adoption of e-Government services in Sri Lankan context.

Based on the above facts, a research on evaluating the adoption of e-Government in Sri Lanka is very much needed at this juncture because the success of e-Government implementation is not only dependent on government support but on citizens' willingness to accept and adopt the e-Government services as well (Carter and Belanger, 2004). Therefore, for any e-Government effort to be successful, citizens' willingness to adopt the system is considered vital.

Literature Survey

Acceptance by the user is a necessary requirement for any Information Technology (IT) project (Pinto and Mantel, 1990). According to Venkatesh and Morris (2003), acceptance is the initial decision taken by an individual to interact with the technology and adoption comes when the user has accepted the technology after he or she directly experiences with the technology. There have been

many researches trying to study the adoption of e-Government in developed countries (Titah and Barki, 2006) but researches on the same for developing countries are minimal (AlShihi, 2005).

A good number of studies on the adoption of e-Government are mainly based on technology acceptance theories and models such as Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), Technology Acceptance Model (TAM) (Davis, 1989), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Diffusion of Innovation (DOI) (Rogers, 1995), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh and Morris, 2003), etc. The UTAUT provides valuable comprehensions and suggestions for understanding an individual's intention of using e-Government services (AlAwadhi and Morris, 2008; Dadayan and Ferro, 2005; Huang *et al.*, 2002)

In United States, a study was carried out by Carter and Belanger (2003) by surveying 140 university students to investigate the factors that influence adoption of the e-Government services by citizens. In this study the researchers used DOI model and the construct that they thought to be most relevant were relative advantage, ease of use, compatibility, and image. They found that higher the relative advantage, compatibility, and image; the more the citizens' intention to adopt e-Government services (AlAwadhi and Morris, 2008).

Carter and Belanger (2004) did another study on citizens' adoption of e-Government services. In the pilot study of their research they surveyed 140 undergraduates in the US using an integrated model incorporating constructs from DOI model, TAM model and Web Trust model. And they discovered that compatibility and perceived usefulness were significant in increasing citizens' intention to adopt e-Government. For the main study of this research they surveyed a group of citizens aged from 14 to 83, and found that compatibility, ease of use, trustworthiness were significantly influencing the citizens' intention to adopt e-Government. In this research, when the findings of the pilot study are compared with those of the main study, the factors influencing the citizens' adoption of e-Government have differences; citizens' demographic attributes also impacted the factors

influencing citizens' adoption (AlAwadhi and Morris, 2008).

One of the e-Government services in Taiwan is Online Tax Filing and Payment System. Chang *et al.* (2006) did a study on citizens' acceptance of this system based on Theory of Planned Behavior by proposing a comprehensive model to elicit citizens' salient attitude towards e-Government services. They found that *ease of use, perceived usefulness, perceived risk, trust, compatibility, external influence, interpersonal influence, self-efficacy and facilitating conditions* (AlAwadhi and Morris, 2008) were the factors influencing the adoption of the Tax Filing and Payment System in Taiwan.

Combining TAM and DOI models, Dimitrova and Chen (2006) did a survey in the US to study the effects of socio-psychological factors that influence citizens' adoption of e-Government in the US. They found that perceived usefulness, prior interest in the government, and perceived uncertainty were the factors influencing the adoption of e-Government there in the US (Colesca and Dobrica, 2008).

In a study done by Phanget *al.* (2005) in China on the senior citizens' adoption of e-Government, basing TAM, they found that perceived ease of use and Internet safety as the influencing factors for senior citizens' perception of the usefulness of the e-Government, image and compatibility being less influencing.

It is noted by AlAwadhi and Morris (2008) that studies on e-Government adoption in developing countries are very few. Akmanet *al.* (2005) did a survey in Turkey to study the impact of gender, education, and citizens' attribute, on the use of e-Government. For the study they surveyed different groups from public and private sectors and found that gender and education had a significant influence on the citizens' adoption of e-Government in Turkey. They found that e-Government services are used more by males than females and the higher the education level, the more interaction the participants had with e-Government services.

Another study was done by AlShihi (2005) on e-Government development and adoption in Oman. For this study he surveyed public as well as private sector

employees and different segments of Omani society; in the research AlShihi found a number of barriers to the adoption of e-Government in Oman. They are *users' lack of IT knowledge, awareness and motivation; the under-marketing of e-government plans and initiatives; a lack of proper legislation and laws; and a lack of trust and confidence by users and culture had little effect* (AlShihi, 2005).

From the above review of literature, many factors such as perceived usefulness ease of use, compatibility, trustworthiness, Internet safety, image, educational level, etc. have been found to be influencing the citizens' adoption of e-Government in developed as well as a few developing countries; but little is known that these factors are applicable in the case of Sri Lanka.

In order to address this existing gap, the study aims to find out the factors that influence the citizens' adoption of e-Government in Sri Lanka by doing a firsthand data collection and analysis using undergraduate students as subjects.

Research Model and Hypotheses

This research used UTAUT model which was created by Venkatesh *et al.* (2003) by synthesizing eight technology acceptance models, which had their origins in psychology, sociology, and communications, to present a more complete picture of acceptance process.

Many researchers have adopted, modified, and validated many theoretical models to understand and predict acceptance of technology and its usage (Venkatesh *et al.*, 2003). Each model tries to predict and explain user behavior using a number of independent variables. The models include the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Diffusion of Innovation Theory (DOI). It was argued by Venkatesh *et al.* (2003) that researchers chose a certain model which they favored and used it by ignoring the contributive factors from other alternative models. Hence Venkatesh *et al.* (2003) reviewed the existing eight user acceptance models (Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), the combined TAM-TPB, the

Motivational Model (MM), Diffusion of Innovation (DOI), the Model of PC Utilization and the Social Cognitive Theory (SCT) and integrated elements found in those eight models and the result of this review is the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). The UTAUT provides better understanding of acceptance of technology by users. Some of the above theoretical models are considered to be the most robust and significant to describe Information Technology and Information System adoption behavior (ibid).

By means of validation and replication, the TAM model has wide support because of its capability to predict the use of Information Systems (IS) and therefore considered as the most strong and dominant model to explain IS adoption behavior. The TAM is said to exclude important causes of variance and does not consider some constraints, such as time and money, which could deprive people from using an IS. Also, because of its generality, the TAM has failed to deliver meaningful detail about user acceptance of particular technology and a few modified versions of TAM were proposed to address contemporary technologies. Therefore a new model was developed to address such limitations; this is the UTAUT (Al-Shafi, 2009).

The study of citizens' adoption of e-Government was motivated to use this UTAUT model because of the comprehensiveness, validity, and reliability of it and the model encouraged the researcher to adopt and validate it in Sri Lankan context.

This research proposed an amendment in the UTAUT model originally proposed by Venkatesh et al. (2003) in order to fit it to the adoption of e-Government in Sri Lankan context. According to the amended model, it is hypothesized that Performance Expectancy, Effort Expectancy and Social Influence are significantly influencing the Behavioral Intension of the citizens and Behavioral Intension are significantly influencing the Use Behavior of the citizens. They are elaborated below.

- **Performance Expectancy (PE):** "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003).
- **Effort Expectancy (EE):** "the degree of ease

associated with the use of the system" (Venkatesh et al., 2003).

- **Social Influence (SI):** "the degree to which an individual perceives important that others believe he or she should use the new system" (Venkatesh et al., 2003).
- **Behavioral Intention (BI):** "the person's subjective probability that he or she will perform the behavior in question" (Venkatesh et al., 2003).

The above four direct determinants are expected to be influenced by the moderating factor; Internet Experience. The amended UTAUT model which is proposed for the evaluation of citizens' adoption of e-Government in Sri Lanka is shown in Figure 1.

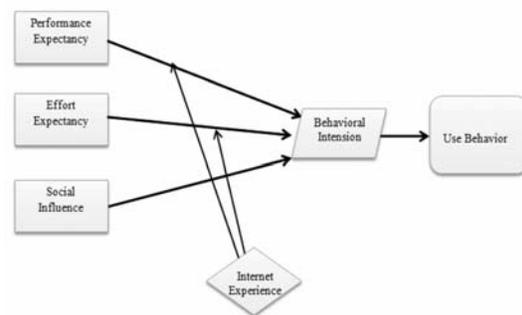


Figure :The Amended UTAUT Model

From the above amended UTAUT model, the following hypotheses have been developed:

- H1:** There will be a positively significant relationship between Performance Expectancy and Behavioral Intention to use e-Government services, and this relationship will be moderated by Internet Experience.
- H2:** There will be a positively significant relationship between Effort Expectancy and Behavioral Intention to use e-Government services, and this relationship will be moderated by Internet Experience.
- H3:** There will be a positively significant relationship between Social Influence and Behavioral Intention to use e-Government services.

H4: There will be a positively significant relationship between Behavioral Intention and Use Behavior of e-Government services.

Methodology

The research employed a quantitative study based on questionnaire survey. Quantitative method enables the researcher to test the relationships between the variables identified in the model and thereby let him provide evidence to support or disprove the hypotheses (Carter and Belanger, 2005). The population of this study included university students (undergraduates and postgraduates) with or without experience in using e-Government services in Sri Lanka. The reason for limiting the sample to university students was for time factor, convenience, and, in addition to these, since Internet is part of these students daily life. Further, when these e-Government services of Sri Lanka are fully completed, these students will be the main users of it. Therefore, understanding their attitudes and perceptions will help decision makers come out with improved services.

Questionnaire developed in Google Docs was emailed to 185 recipients during April/May of 2013 and a total of 135 complete questionnaires were received back, the response rate of 72.97%. Since the e-Government project of Sri Lankan government is not very well-known a small introduction was given in the questionnaire itself. Respondents were instructed to mention their by using Likert scale type questions. Constructs and statements were adopted from previous researches.

Data Analysis and Results

A. Overview of the respondents

Majority (54.1%) of the respondents were male and 45.93% were female. 58.5% of the respondents within the range of 20-25 years of age. 59.3% of them were undergraduates, 28.8% Graduates and 11.9% were holding Postgraduate degrees. Majority (41.5%) of the respondents had been using Internet for more than six years, 28.9% had been using the Internet less than six

years but more than three years, 21.5% of them were using it between one and three years while 8.1% of them were using for less than one year. 50.4% of the respondents claimed their Internet proficiency to be Good, 25.2% of them claimed as Very Good, 16.3% ranked Excellent meanwhile 8.1% ranked them to be Fair. As opposed to the expectation of the researcher, 25.6% of the respondents had used e-Government services before while 74.4% never used, which is a positive indication for the citizens' adoption of e-Government services.

B. Reliability of the Modified UTAUT

Reliability of the scale constructs was tested using Cronbach's alpha and their values are given in Table 1, with all constructs earning values greater than .5.

UTAUT Scales	Cronbach's Alpha coefficient	No. of Items
Performance Expectancy	.806	8
Effort Expectancy	.587	7
Social Influence	.687	3
Behavioural Intension	.652	2

Table : Reliability of the model constructs

Based on the modified UTAUT model, a regression analysis was done with the inclusion of independent variables, dependent variables and moderating variable. Intension questions asked the respondents if they had intension to use e-Government services in "One Month" or " Three Months" and changes in respondents intension to use the e-Government services was explored using these Intension question, thereby making the Behavioural Intension construct's outcome as binary.

Behavioural Intension and Use Behaviour were the two variables with binary outcomes. To investigate the relationship between independent and dependent variables, Logistic regression analysis was carried out using SPSS software.

C. Results

A regression analysis process was undertaken based on the amended UTAUT model which included independent variables, dependant variables and a moderator. The study attempted to explore any changes

in respondents' intentions through the "intention" question, which asked respondents whether they intended to use e-Government services in the future: in "One Month" or "In Three Months". Thus, this made the behavioural intention construct a binary outcome variable.

Since there were two binary dependent variables (Behavioural Intention and Use Behaviour), the analysis was run separately for each. Logistic regression analysis, using SPSS, was utilized to facilitate the analysis to investigate the relationship of predictor variables to outcome variables.

In the analysis, the main predictors, performance expectancy (PE), effort expectancy (EE), Social Influence (SI) and their interactions with the moderator (Internet experience) were used to predict the behavioural intentions (BI) with regard to their use of e-government services in the two phases. The first phase concerned the respondents' intention to use e-government services within one month following the survey and the second phase concerned their intention to use e-government services within three months of the survey.

In the first phase of predicting respondents' behavioural intention regarding their use of e-government services within the One Month (following the survey), a logistic regression model was conducted on BI within the next One Month using performance expectancy, effort expectancy and social influence and their interactions with the moderator (Internet Experience). The regression model was obtained by the forward stepwise method, adding predictor variables iteratively. The results indicated that only the significant values of Wald statistics, where effort expectancy ($B=0.065$; $S.E=0.042$; $df=1$; $p<0.001$), social influence ($B=0.063$; $S.E=0.013$; $df=1$; $p<0.011$), performance expectancy x Internet Experience ($B=0.047$; $S.E=0.018$; $df=1$; $p<0.010$) and effort expectancy x Internet Experience ($B=-0.043$; $S.E=0.030$; $df=1$; $p<0.021$) were significant, thus partially supporting hypotheses H1, H2 and H3. This suggests that these variables significantly predicted respondents' behavioural intentions with regard to their use of e-government services within One Month following the survey.

In the second phase of predicting respondents' behavioural intentions with regard to their use of e-Government services within Three Months following the survey, similar predictors and their interaction were tested. In this phase effort expectancy was still found to be a significant predictor of behavioural intention within Three months following the survey ($B=0.038$; $S.E=0.024$; $df=1$; $p<0.26$), performance expectancy was also found to be a statistically significant predictor of behavioural intention ($B=0.062$; $S.E=0.026$; $df=1$; $p<0.001$); whereas, social influence was no longer a significant predictor of behavioural intention in this phase. In addition, the interaction of performance expectancy x Internet experience and effort expectancy x Internet experience appeared not to make any significant contribution to the prediction of BI. These results partially supported hypotheses H1 and H2.

Participants' use behaviour regarding the e-government services was investigated in the second stage of the analysis. A logistic regression was conducted on use behaviour using behavioural intention. The Wald statistics showed that behavioural intention was a significant predictor of use behaviour ($B=0.126$; $S.E=0.037$; $df=1$; $p<0.001$) and the result supported H4.

Discussion

The respondents showed a positive mindset towards e-Government services though a majority of them did not use e-government services. The practical test of the amended UTAUT model identified factors determining the intention and use of e-Government services as well as the effect of moderator on the relationship between the dependent and independent variables. For the time period of "One Month", the direct relationship between performance expectancy and behavioural intention was not significant. The influence of performance expectancy on respondents' behavioural intentions was significant only for the period of "Three Months".

However, it became significant when the relationship was moderated by respondents' Internet experience where the effect of performance expectancy on behavioural intention increased with greater

Internet experience. This indicates that respondents with greater Internet experience have realized the benefits they get from using the Internet and can relate such benefits to the use of e-Government services. The significant and strong influence of performance expectancy on respondents' intention, in the time period, suggests that they tend to focus on the usefulness of e-Government services and specifically on what they will gain from using such services. Therefore, for e-Government services to be accepted by the public, it would be necessary to demonstrate the advantages and benefits they are likely to provide for users.

The direct relationship between effort expectancy and behavioural intentions of respondents was significant in both time periods. The relationship was also moderated by their Internet experience for the time span "One Month", such that once Internet experience increased, effort expectancy became less important. This is because many respondents are confident in their Internet abilities which would enable them to use the services. The statistically significant influence of effort expectancy suggests that respondents are apt to use e-Government services when they are easy to use enabling them to have more time for other activities. Although effort expectancy became less important for those with greater levels of Internet experience, the results highlight the need to provide easy e-Government services especially since the target population will have different levels of Internet experience. The results showed that social influence was significant to respondents' intention only in period of "One Month". This suggests that social influence becomes more significant and important when individuals have limited experience of online services. Therefore, it is essential that government bodies ensure that users have a positive experience while using the e-services as their experience might influence the people important to them.

Conclusion

This study used amended UTAUT model to study the impact of Internet Experience on the citizens' adoption of e-Government services in Sri Lanka and found that performance expectancy, effort expectancy and social influence were significant in the adoption of

e-Government services in Sri Lanka, being consistent to some extent with others found in developed countries. Although the subjects of the study are university students, having limited generalizability, the study provided many insights into the motivations underlying the intentions to use e-government services in developing countries. The amended model will be useful for more researches trying to find out e-Government adoption factors in developing countries. In addition, researches in the future can incorporate diversified subjects and more variables such as gender, age, etc.

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