Significant Factors Determining E-government Adoption in Selangor, Malaysia

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Abstract: Studies have shown that low adoption rate among citizens has been hindering the optimization of e-Government services especially in developing countries. Hence, one of the critical measures that has to be undertaken is to identify and overcome possible barriers to further facilitate a higher rate of adoption. A multistage stratified sampling was used in this study to collect data from 1000 respondents, both user and non-user residing in the state of Selangor, Malaysia. This state was chosen as to provide a better understanding of low adoption when issues of basic facilities have been successfully overcome. An exploratory factor analysis was performed to identify latent constructs and seven key factors were identified. A multiple regression model was subsequently used to analyze significant factors in determining the willingness to use e-Government services. The determinants are language barrier, educational level, secure, format, easy to use, enjoyable, reliable, visual appeal and infrastructure. The result shows significant variables that act as barriers to adoption are reliable, enjoyable, easy to use, secure, and language used. The constraints pointed out in the open ended questions mainly focus on the issue of accessibility, ease of use and awareness. Overcoming these obstacles is therefore crucial in order to enhance the usage of e-Government services which consequently will improve the quality of public administration in Malaysia.

Keywords: e-Government; e-Government Adoption; e-Government Barriers

JEL Classification: H11

1. Introduction

The implementation of e-Government services in Malaysia started in 1996 with the objectives of increasing the convenience, accessibility and quality of interactions between government, citizens and businesses (Ahmad, 2007). Research in e-Government services has highlighted the various benefits to governments when they provide their services online. E-Government often promises the outcome of better government including improved quality of services, cost savings, wider political participation, and more effective policies and programs (Garson, 2004; Bourquard, 2003). It also added new concepts such as transparency, accountability and citizen participation in the evaluation of government performance (Mohammad et al., 2009). It reduces red tapes and jurisdictional barriers to allow a more

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integrated and efficient services across the federal, state, and local governments. A particular characteristic that makes it even more unique is that it allows citizens to seek public services at their own convenience, be it space or time (West, 2004). Since e-Government makes it easier for citizens to participate and contribute to governmental issues, citizens are increasingly expecting government bodies to be more efficient, similar to the private sector (Reynolds & Regio, 2001). Hence, it acts as a catalyst to a higher quality and cost effective government services, promoting better rapport between citizens and government (Fang, 2002).

Nonetheless, some studies argued that e-Government has yet to accomplish its expected outcome (Jaeger, 2003; Garson, 2004) as the failure rate of e-Government projects may be as high as 85 percent (Heeks & Bailur, 2007). Despite large investment, critiques have also argued that the uptake of e-Government services among citizens is still faced with the issue of optimization. The extensiveness of usage especially in the less developing countries has been limited. The low rate of adoption in countries like Malaysia will make e-Government services costly especially when there is also the perpetual need to cope with the rapid dynamics of technological changes. There is also a risk that the digital divide among citizens will deepen, and this will further marginalize disadvantaged citizens.

However, access and the extensiveness of usage have always been linked to the economic development of the state or a country. Less developed states or countries are facing infrastructural facilities issues which include accessibility to the service itself. Thus, it becomes more crucial to fully understand factors contributing to the adoption of e-Government services especially in developed states when issues of basic facilities have been successfully overcome.

Based on these assertions, this paper attempted to analyze and identify significant factors that determine the adoption of e-Government services in the state of Selangor. Although these factors have been discussed by researchers from various perspectives, this paper will focus from the demand point of view since critiques of e-Government have pointed out that this service has been too supply driven and should be more user centered. A multiple regression model was used to achieve this objective as depicted in step 2 in Figure 1. To give an in depth understanding of the issue, mean analysis of the measurement items for each significant factor was further analyzed. Thus, the research framework for this study is as in Figure 1.

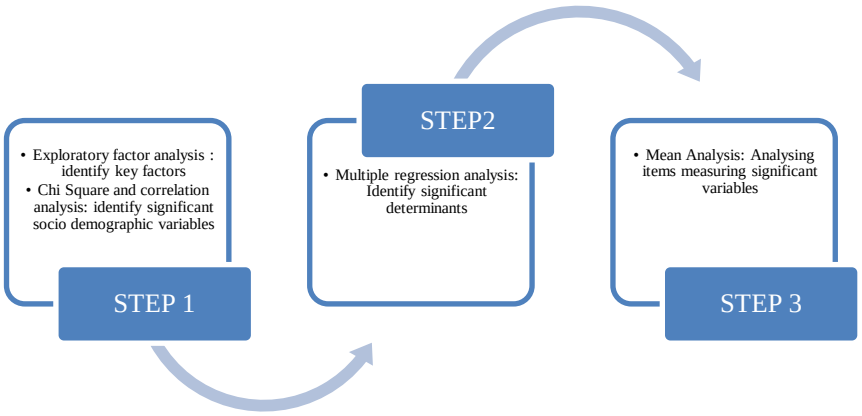

Figure 1. Research Framework

2. Literature Review

Previous studies had shown that acceptance and usage of e-Government services are still very limited in most countries. This consequently has a dampening effect to the progressiveness of the implementation of e-Government (Bertot & Jaeger, 2008; Ebbers et al. 2008) which is seen to be one of the best alternatives in improving government services (Jaeger, 2003; Bekkers & Homburg, 2007). The low rate of adoption will create optimization issues, and consequently reduce expected benefits (Norris & Moon, 2005).

Identifying barriers to e-Government services has thus becoming an important task that requires an in depth understanding of the issue, as to enable an increase in the adoption of this service. These barriers are referred to as

"*the real or perceived characteristics of the social, technological, legal and institutional context which hinder the development of e-Government, either through hampering demand by the citizens and business for e-Government services or through obstructing supply of e-Government services by the public sector"*

(Norris & Moon, 2005).

Most studies have adapted three main approaches in identifying factors determining adoption (Gilbert & Balestrini, 2004); namely diffusion of innovation (Rogers, 1995), modifications of the technology acceptance model (Davis & Bagozzi, 1989) and the application of the existing framework to technology which includes service quality (Dabholkar, 1996). However, technology acceptance model (TAM) is one of the most extensively used theories to predict information technology (IT) adoption; which is also been used to determine possible barriers to adoption. The theory emphasizes that perceptions about usefulness and ease of use are the determinants that influence technological adoption. However, the theory of

diffusion of innovation asserts that there are five basic stages in which an innovation is accepted or rejected; those are knowledge, persuasion, decision, implementation, and confirmation. However, based on previous literature, other constructs which were identified as barriers include confidentiality, reliable and safe (Gilbert & Balestrini, 2004).

In a developing country like Malaysia, studies have also shown that access to computers and internet services are also hindering the adoption of e-Government services (Alhabshi, 2010). The digital divide among citizens will also impede the benefits of e-Government (Ahmad, 2007). In some cases, citizens were not even aware of the existence of such services. Therefore, these issues should also be considered in identifying the factors to e-Government adoption.

3. Methodology

Development and growth among the states of Malaysia vary significantly. The state of Selangor was chosen for this study because it is one of the most developed states in the country. e-Government services are more readily accessible to the citizens of this state and this keeps homogeinity in the exposure to ICT technology in the targeted population. A multistage stratified sampling technique was done to identify n=1000 potential respondents, in which n is predetermined by the budget and time constraints faced by the researchers. The nine districts in the state which are Sabak Bernam, Hulu Selangor, Kuala Selangor, Gombak, Petaling, Klang, Hulu Langat, Kuala Langat and Sepang were stratified into three strata; namely developed, developing and less developed districts. These strata were further divided into sub strata based on rural and urban areas.

Questionnaire was used as an instrument to collect information by interviewing 1000 respondents of which 7 questionnaires were deemed spoilt due to too many non response items. The collected data included all the necessary items and constructs in determining the findings which include user experience, exposure to e-Government services and socio demographic characteristics. Each item in the construct was measured on a seven-point scale (7='Strongly agree' to 1= 'Strongly disagree'). It is suggestive of the respondent's opinion on the importance of that particular item.

Based on previous studies, barriers to adoption were segmented into issues pertaining to connectivity and non connectivity. Hence, six factors were identified as potential connectivity barriers in this study; which are secure, easy to use, enjoyable, reliable, infrastructure and visual appeal. Non connectivity barriers are socio demographic characteristics of the respondents which include education, income, skill and gender.

4. Findings

Table 1 summarizes the demographic profile of the surveyed respondents. Almost all of the respondents (97.2 percent) from the remaining 993 samples were internet users. The gender distribution was at 49.1 percent males and 50.9 percent females. Majority of the respondents had more than basic knowledge in IT. Three major modes of communication with the government are via the internet, telephone and counter services.

Exploratory factor analysis was further used to identify the number of key factors at explaining the variance within the data. The Kaiser Meyer Olkin measure of sampling adequacy was 0.911, above the recommended value of 0.6 and Bartletts test of sphericity was significant (X^2 (406)=14080.836, p= .000). All six of the original variables remained and one factor is a combination of items obtained from two other variables that was earlier proposed and this factor was identified as format. A reliability analysis was conducted to test the accuracy of the measuring instruments. The reliability for the measures ranges between 0.749 and 0.825. A Cronbach Alpha score above 0.7 is considered as reliable (Nunnaly, 1978). This seems to be in an agreement with previous studies which identified these factors as major barriers to adoption (Gilbert & Balestrini, 2004).

Table 1. Demographic Characteristics of Respondents

Variables		Percent
Gender	Male	49
	Female	51
Location	Rural	37.6
	Urban	62.4
Skill Level in IT	Unskilled	3.6
	Basic skilled	18.8
	Moderately skilled	28.1
	Skilled	38.7
	Highly skilled	10.8
Educational level	PhD	.7
	Masters	8.5
	Bachelor Degree	38.0
	Diploma/STPM (High School Cert)	24.5
	SPM/SPMV (Secondary School Cert)	22.8
	Less than PMR (Lower Secondary School Cert)	5.6

Table 2 contains the means and reliability analysis for each barrier variables. All variables except infrastructure have a mean ranging from 4.5 to 5.0. Since these values were taken from a seven-point scale, these satisfaction levels prove that e-

Government services can be further improved by taking the appropriate and necessary measures.

Table 2. Means and Reliability Analysis

Construct	Mean	Reliability Analysis	
		No of Item	Cronbach's Alpha
Secure	4.578	6	0.778
Format	4.948	3	0.825
Easy To Use	4.776	7	0.803
Enjoyable	4.500	3	0.793
Reliable	4.546	3	0.823
Visual Appeal	4.932	5	0.782
Infrastructure	3.566	3	0.749

Table 3 shows the relationship between nominal demographic factors which are race, marital status, gender, residential location and willingness to use e-Government services among the respondents. Since none of the factors are statistically significant ($p > 0.05$), these factors were consequently omitted in the regression analysis.

Table 3. Demographic Vectors And Willingness To Use E-Government

Factor	Chi Square Value	Df	p value
Race	50.465	36	0.056
Marital Status	31.362	36	0.689
Gender	10.823	12	0.544
Rural Urban	13.682	12	0.322

Correlation was tested between scale values non connectivity factors and willingness to use e-Government. These include number of family members in the household, age, number of children, educational level, income, computer literacy, internet experience and understanding of language used in e-Government websites. Only two results are statistically significant; hence, indicating significant relationship between language used, educational level and willingness to use e-Government services.

4.1. Regression Analysis

Table 4. Results of Multiple Regression

Independent Variables		β_i	Std error	P value
	(Constant)	-3.398	.200	.000
	Easy to Use	.181	.027	.000
	Secure	.066	.023	.004
	Reliable	1.978	.049	.000
	Format	.003	.017	.850
	Enjoyable	.191	.019	.000
	Visual Appeal	-.023	.019	.225
	Infrastructure	-.001	.013	.911
	Language	.490	.019	.000
	Education	.003	.002	.100
	Awareness	-.050	.029	.082
	R^2	.728		
	Adjusted R^2	.725		
	Estimated standard error	.59356		
	F	225.304***		
	N	993		

****level of significance 1%*

A multiple regression analysis was subsequently performed to investigate the relationship between willingness to use e-Government and the seven independent factors identified in the factor analysis. The significant socio demographic factors were also included in the analysis. This method allows the identification of independent factors that are able to predict and have the greatest impact on the dependant variable which is willingness to use. The results are shown in Table 4. The linear combination of factors are significantly related to the dependant variable accounting for approximately 73 percent of the variance ($F(11,928) = 225.304$, $p < 0.05$). Five independent variables, namely format, visual appeal, educational level, awareness and infrastructure are found to be insignificant ($p > 0.05$). The strongest predictors at the 95 percent confidence level, or in other words, factors perceived by the respondents as barriers to adopting the e-Government services consecutively are reliable, language used, enjoyable, easy to use and secure.

4.2. Mean Analysis of Items Measuring Significant Variables

The items measuring each of the significant variables were then analyzed to give an in depth understanding of the issue at hand.

Table 5. Mean For Items Measuring Significant Variables

Variable	Item	Mean
Reliability	Performs reliably	4.26
	Operates reliably	4.34
	Dependable	4.33
Ease of Use	Easy to use	4.74
	Able to do what I want it to do	4.70
	Easy to operate	4.77
	Able to learn the system quickly	4.69
	Guidance on usability	4.76
	Able to operate at anytime any place	4.65
Security	Acknowledge receipt of transaction	4.56
	Protection of personal information against unintended or unauthorized access	4.60
	Security of the transaction:	4.58
	I trust the e-Government filing system	4.57
	I trust the e-Government payment system	4.59
Enjoyable	Enjoyable	4.26
	Most preferred medium of transaction	4.34
	Part of my lifestyle	4.33

The scores for each items ranged from 4.26 to 4.77 from a 7-point scale. This shows moderation in the satisfaction level for all of the items. Since these are the significant factors in determining the willingness to use the e-Government services, improvements in aspects detailed by the items should subsequently lead to increased usage. Alternatively, these items could act as barriers to adoption if there is no improvement made and if services deteriorate from the present state. From a positive perspective, moderation in the satisfaction level implies great potentials in increasing the adoption rate if effective measures are taken to improve services pertaining to the items detailed in Table 5. Reliability is measured by three items related to the functionality of the system; i.e. in terms of its performance, operation and dependability. The means for the items measuring this variable are among the lowest in comparison to other items in the table. Hence, serious efforts to increase reliability of e-Government services would mean an increase in the adoption rate. Since respondents have the alternatives of getting the government services manually, mean value for each item in enjoyable is also relatively low. Ease of use which relates more to the information quality provided by the services must also be upgraded to stimulate increased usage.

5. Conclusion

Critiques have argued that so far e-Government services have been too supply driven. The services given are too technological oriented and heavily focused on the adoption of the most advanced technology available. As a consequence, citizen actual needs are sometimes overlooked. A paradigm shift in perspective is needed to remedy the low uptake among citizens. Government should provide services in ways that is acceptable from the citizens' point of view. A citizen - centric government is a better approach at increasing e-Government services usage; whereby citizen needs and demands are taken into full consideration in the decision making process. Hence, overcoming the obstacles that could act as a barrier to the adoption of e-Government services should be one of the most important agendas.

e-Government is an important catalyst in improving the quality of public administration in Malaysia. Public awareness and support from all stakeholders, including citizens, NGOs, the private sector are essential in ensuring that the expected benefits are reaped from its implementation. Although e-Government services in Malaysia should be molded according to the needs of the people in this country, understanding the guidelines and practices implemented by other countries can provide a shortcut to the government especially in enhancing and developing its services. This measure will reduce the inconvenience, cost, time and resources by the government. Other measures include the understanding of current trends and review best practices that have been carried out globally. Observation must be comprehensive, which covers both the demand and supply aspects of e-Government services.

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