

USER ADOPTION AND USE OF E-GOVERNMENT ONLINE SERVICE

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ABSTRACT

There is evidence of a universal shift toward modern online public services. Governments and public sector organizations around the globe have to take notice of this phenomenon, becoming aware of its potentials and incorporating information technology in delivering better services to the public via e-government. The prime aim of e-government in Malaysia is to serve the 'rakyat' (citizen) and to have better online service. Although it is clear that citizen is the main user of e-government online services, there are only few studies conducted on the issue of citizen adoption of the online service. This paper presents the level of citizen adoption as one of the perspectives of e-government implementation. The model is built on the Technology Adoption Model (TAM) and Technology Planning Behaviour (TPB) and literature related to these models.

Keywords: e-government, service delivery, online service, user adoption, citizens

INTRODUCTION

All around the world, the quest to improve government service delivery is becoming an important agenda for most governments. Information and communication technology (ICT) and the internet in particular have opened new possibilities for the government and the governed. Successful delivery of online services has rapidly become an important measure of effective public sector management and this has made many governments deploy electronic government (e-government) as a tool to achieve this vision.

The transformation of government into e-government has then turned out to be a global phenomenon (Anderson & Henriksen, 2006; Hazman et. Al, 2006; Layne & Lee, 2001 and Tolbert & Mossberger, 2006). However, many studies indicate that a large proportion of initiatives to implement e-government around the world have not succeed in achieving these promised goals because there are many challenges faced by e-government implementers.

Among the challenges identified in a report by Center of Democracy & Technology (2002) are ICT infrastructure development, law and policy, digital divide, e-literacy, accessibility, trust, privacy, security, education, publicity (promotion) and training as well as regular evaluation of the progress and effectiveness of e-government investments to determine stated goals and objectives achieved.

However, there is a gap in these studies which does not include citizen adoption as one of the challenges in implementing e-government. As e-government main goal is to serve the citizen ('rakyat'), thus, citizen ('rakyat') adoption should be taken into consideration when further developing e-government.

Background Literature

E-government is also perceived as "means of delivering government information and service (Moon and Norris, 2005).

E-government is the use by government agencies of information technologies, i.e. the internet and WWW and mobile computing that have the ability to transform relations with citizens, businesses and other arms of government

(Work Bank, 2003)

Government consists of G2G (government to government), G2B (government to business) and G2C (government to citizen) elements. According to Sameer and Mohammed (2008) many studies on government to citizen (G2C) are based on the theoretical frameworks derived from Rogers' (1983) diffusion of innovation (DOI) theory. The other theories which have contributed to the formation of the proposed framework are: theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975); Theory of Planned Behaviour (TPB) (Ajzen (1985), Technology Acceptance Model (TAM) (Davis, 1989) (Carter and Belanger, 2004; Dimitrova and Chen, 2006; Gilbert et al, 2004; Horst et al, 2007). Table 1 provides an overview of studies that have considered models based on these established theories to provide a better theoretical understanding of the influence of individual's beliefs and 'intension to use' the technology.

Author/ Year	Theoretical Frameworks	Studies which have considered these frameworks for investigation
Roger (1983)	Diffusion of Innovations Theory (DOI)	Carter and Belanger (2005); Fu et al (2006); Schaupp and Carter (2005)
Ajzen (1985)	of Planned Behavior (TPB)	Horst et al. (2007) Warkentin et al. (2002)
Davis (1989)	Technology Acceptance Model (TAM)	Carter and Belanger (2005); Dimitrova and Chen (2006); Gilbert et al. (2004) Horst et al. (2007)
Individual Factors		
	Perceived Risks Perceived Barriers Perceived Uncertainty and Civic Mindedness Trust in e-government Gender and Education Experience and Skill	Fu et al. (2006) Gilbert et al (2004); Pilling and Boeltzig (2007) Dimitrova and Chen (2006) Carter and Belanger (2005) Schaupp an Carter (2005) Akman et al (2005) Choudrie et al (2005); Dossani et al. (2005); Pilling Boeltzig (2007)

Table 1: Studies examining influence of individual beliefs.

Empirical suggestions of some e-government studies often differ with findings in the literature. As Deursen et al, (2006) posit that despite similarities in Dutch and Scandinavian culture, welfare state and political system; the usage of e-government vastly differs in these countries. The time span to undertake comparative empirical research is considerably long and in this regard, Moon and Norris (2005) suggest that longitudinal studies of more than two years could provide more clarity in the results. However, this is only practical when the researcher is doing a comparative study.

Characteristics of citizens

Sameer and Mohammed (2006) posit that in a G2C context, various studies have investigated individual characteristics that affect attributes of e-government such as: quality of website (Barnes and Vidgen, 2006), access to e-government (Choudrie et al, 2005; Gilbert et al. 2004; Pilling and Boeltzig, 2007), measurement and assessment of benefits (Gupta and Jana, 2003), infrastructure (Dossnai et al. 2005); intention to us e-government (Carter and Belanger, 2005; Horst et al, 2007; Sheaupp and Carter, 2005; Warkentin et al, 2002). The results from these studies are overwhelming and confusing to an extent that conceptual clarity is required to investigate holistic view of e-government adoption.

In the extant literature of technology adoption, perceived usefulness (PU) and perceived ease of use (PEOU) have been accepted as the dominant beliefs that affect intention/usage of technology and e-government (Warkentin et al, 2002). Horst et al, (2007) examined the determining factors of e-government service adoption in the Netherlands and found that perceived usefulness of e-government services has no direct influence on intention to adopt e-government. They have also found out that 'perceived behavioural control' (PBC) does not influence intention to adopt e-government, which is one of the major constructs of a model based on Theory of Planned behavior (TPB). Horse et al, (2007) suggest that smaller size of sample may have influenced the results and conclude that there is a need to substantiate their findings in another research.

Gilbert et al (2004) agree with Horst et al (2007) that perceived usefulness and perceived ease of use are insignificant in their ability to influence adoption of e-government services which is in contrast with the commonly accepted literature. However, their research is basically emphasize on identifying the important factors in evaluating the use of e-government service rather than measuring the perceptions on the use of service. Drawing on Higgins and Ferguson's (1991), Gilbert et al, (2004) suggest that the functional aspects of the service should be clearly distinguished form the technical aspect of the service. There is also a clear barrier to adoption of technology that is financial information and trust.

Another factor is demographic of citizens. The moderating role of demographic characteristics of individuals such as age, gender, education, work experience and reason for using the technology has been explored in the Venkatesh et al (2003) B2C study. However, this is yet to be proven in G2C studies. Akman et al (2005) concluded that gender gap existed in accessing the internet and e-government. He suggests that his findings are in contrast to the study of Levy (2002) in the US that suggests "disparity" in internet usage between men and women has largely disappeared".

Malaysia Online Service Adoption

Since 1980s the public service has witnessed governmental efforts to strengthen service delivery. This was done by reducing red tape and by streamlining work procedures and methods. New systems, techniques and procedures of administration were introduced, unnecessary and redundant procedures were abandoned. The counter services have been upgraded (Siddiquee, 2006). These attempts are all for the benefits of upgrading and improving the quality of services offered.

Malaysian government first connected to internet in 1990 when MIMOS Bhd. launched JARING. In 1996, Telekom Malaysia then launched the second ISP, which is the TMNet (Rahmah, 1999). The National IT agenda has been promoting the IT implementation in every sector in Malaysia ever since 1996. There have been many studies conducted on IT implementation in the public sector as well as e-government adoption in Malaysia but many on user adoption of e-government online service.

Based on the above literature the researcher realized that there is a gap in the study of user adoption in Malaysia, therefore, the researcher wish to fill in the gap by conducting a research, at the state level of Pahang; one of the states that has failed to reach the "5-star" target in offering its e-government online service. How do the citizens rate the quality of Pahang website, how do the users perceived the usefulness of online service, do they trust the state e-government system when supplying personal information online and lastly, what is the level of citizen adoption of e-government online service.

Taking off from the literature discussed, the researcher would like to incorporate user perceived usefulness of the online service system, user perceived ease-of-use, perceived e-government website quality as well as user trust on the system. These variables will be used to determine the state of Pahang user level of e-government online service adoption.

E-Government in Pahang

Malaysian government as the public service provider should understand the demands and challenges of the 21st century public service because citizens are demanding more value for their money from the government. They need more choices, better service quality and greater accountability for the money they spent on taxes. Thus, to retain credibility with the citizens, government must actively try to meet these new expectations (Najib, 2007). In

this effort, MAMPU and MDeC are working together to ensure constant evaluation is done to assess websites all over the country. In the course of ensuring e-government evolution and development, all government websites have to participate in this annual evaluation. Websites are ranked and awarded stars as indicator of their progress and achievement.

Pahang state government secretary realized that the working environment is becoming more difficult to keep up with the dynamic of technology. Working culture has to change according to the advancement of technology, thus, government staff have to be aware of their responsibilities and roles to ensure e-government success. So far, Pahang state government secretariat office as the main gateway to Pahang state government has managed to get 3 stars (MDeC Report, 2009).

The state government is serious in transforming their websites, online services and information offered online for the purpose of serving the citizen. However, this project will have to consider the internal as well as external factors in order to ensure success. Therefore, the state government should realize the demand of the citizen such as what is the level of user adoption towards the government online service in Pahang? What kind of on line service do they really want online and what about the level of security and privacy they required when doing online transaction? What are the determinants of user e-government online service adoption? All these questions require answers and a study should be conducted to gain insight on this issues.

Research Model

The research model in this study will examine the intention of user to adopt e-government online service based on their perceived usefulness of the service, trust, satisfaction and perceived service quality.

Conceptual Research Framework

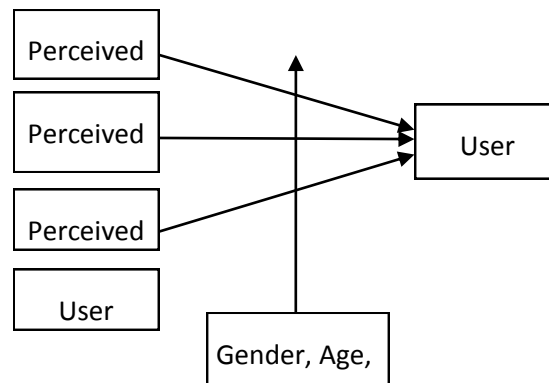


Diagram 1: Proposed Conceptual Research Framework

Proposed Variables Affecting User Adoption (Intention to Use) of E-Government Online Service

The model constructed is based on the Technology Planned Behaviour (TPB) (Ajzen, 1985) and TRA (Davis, 1989) as well as literature review based on Sameer & Mohammed (2008); Horst et al. (2007); Warkentin et al. (2002); Carter and Belanger (2005); Dimitrova and Chen (2006); Gilbert et al. (2004); Carter and Belanger (2005); Schaupp & Carter (2005) and Akman et al (2005); Pavlou (2003) and Warkentin (2002)

Dependent Variables

In this study, the dependent variable is the user adoption of the government online service will determine the demand of the level of e-government online service adoption.

Independent Variables

Independent variables are the variables that are expected to affect the user level of e-government online service adoption (intention to use).

- a) Perceived usefulness:
Perceived usefulness is defined by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis,

- 1989).
- b) Perceived ease-of-use:
In this study perceived ease-of-use is considered as the ease of accessibility of the state government website.
 - c) Perceived Quality
Quality in this study is considered as the quality of the website content which offers e-government service accessed by the users consisting of the information and the online services offered.
 - d) User Trust
It has been proven in several studies that trust is an important variable in determining the public's demand on e-government online service. In some studies three modes of trust productions (Welch, 2003) will determine public's trust in interaction with government. These are (Zucker, 1986):
 - i) Characteristics based trust: personal characteristics based on race, age or gender.
 - ii) Process-based trust: expectation of reciprocity which the giver obligates the receiver to return goods or services of equivalent value.
 - iii) Institution based trust: through adoption of professional standards or codes of ethics or indirectly through the observance or administration of laws and regulations.

However, in this study, the researcher refers trust to the perception on the service they are using, e.g. security, privacy and confidentiality of the information given online.

Hypotheses

The researcher tries to prove four hypotheses:

- H₁ Perceived usefulness has a positive relationship with user online service adoption.
- H₂ Perceived ease-of-use has a positive relationship with user online service adoption.
- H₃ Perceived quality has a positive relationship with with user online service adoption.
- H₄ User trust has a positive relationship with user online service adoption.

Methodology

A set of questionnaire was distributed to government staff working at the state district offices in Pahang. A total of 332 responses were received from 11 districts all over Pahang.

Findings

Demographic

There are about 60.5% female and 39.3% male participated in this study with an average age of 26 – 30 years old. The majority of the respondents are in the supporting position. A majority of 82.5% have browsed Pahang e-government website especially the state government official website of the State Secretariat Office as the gateway site to Pahang state official website.

The majority of the respondents which is 41.9% browse the state government website only when necessary, 18.4% several times a week, 13.3% several times in a month, while 17.8% browsed the state government website everyday. 3.9% of the respondent browse once a month and another 2.4.0% browse the website once a week. Most of the respondents browsed the e-government website to get information (77.7%), while 55.4% get latest news, 47.0% use it to apply for a job. A total of 48.8% of them download forms and other materials from the state government website, while the other 24.4% use it to do online transaction (payment).

Usage of E-Government Online Service

From the analysis, it was found that among 332 respondents, 258 like to use online service (77.7%). They often browsed the state government website and the most visited website is the State Secretariat Office, followed by the Public Service Commission Office (70.2%), and Finance and Bursary Office (33.4%). The land and Minerals Office (34.9%, JKR (26.8), Veterinarian Service (24.1%), Water Utility Department (23.8%), Islamic Religion Depart-

ment (20.2%), Rural Development, JPS and Public Service Department and the Office of the Royal Highness Sultan of Pahang each 17.2%, the Agriculture Department 16.4%. The Forestry, Sayriah and Islamic Judiciary Office and the Mufti Office each 11.9%, 11.6% and 11.1%.

Among these respondents, there are about 4.8% of the respondents who have never used Pahang state government online service. In addition to this, there are about 22.1% who do not understand e-government and 77.9% stated that they understand what e-government is all about.

There are 76.1% respondents who like to use the state government online service while 5.7% do not like using this service. Another 16.6% are unsure about this. Among them are 39.2% & male and 60.8% female.

Reliability Value

Based on the response collected from 332 respondents all over Pahang state, the findings are as follows:

No.	Variables	Reliability Value
1	Perceived usefulness (benefits of services)	0.826
2	Perceived ease of use (web accessibility)	0.889
3	Perceived trust	0.899
4	Perceived quality (web content)	0.912

Table 3: Reliability Cronbach Value

Relationship between variables

A correlation analysis was conducted on these four hypotheses. From the analysis, it was found that there is a 0.772 value between perceived usefulness and actual user online service adoption. Therefore there is an evident that the null hypothesis can be rejected thus, accepting the hypothesis that perceived usefulness has a very strong relationship with the actual user adoption of the online service.

From the correlation analysis it was also found that there is a significant value of 0.772, thus, proving a strong relationship between perceived usefulness and user adoption of online service.

According to Diagram 2, among the relationships, the most significant is user perceived usefulness while the other variables such as perceived ease-of-use, perceived quality and user trust even though have significant relationships but are not as high as perceived usefulness factor.

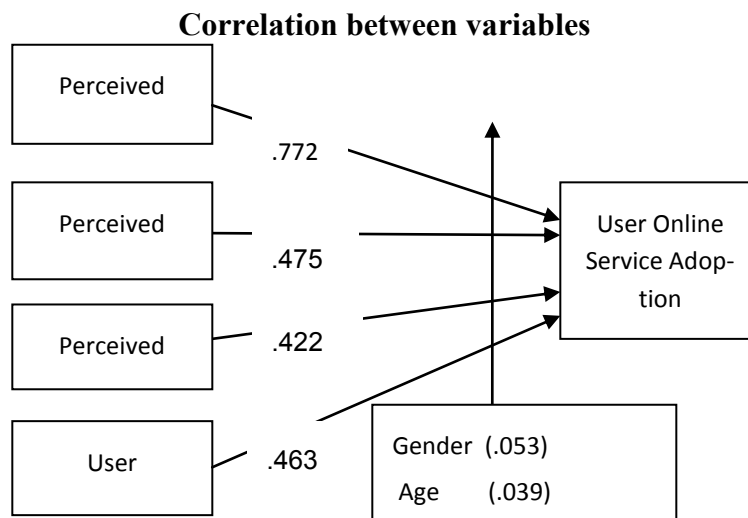


Diagram 2: Diagram showing correlation (alpha value) between variables.

Table 4 shows evidence that demographic factors like gender, age and education do not indicate that they have significant relationship with the actual user adoption of e-government online service in Pahang.

Correlations						
			User Adoption	Gender	Age	Education
Spearman's rho	User Adoption	Correlation Co-efficient	1.000	.053	.039	-.029
		Sig. (1-tailed)	.	.168	.242	.298
		N	331	330	331	331
	Gender	Correlation Co-efficient	.053	1.000	-.113*	.153**
		Sig. (1-tailed)	.168	.	.020	.003
		N	330	331	331	331
	Age	Correlation Co-efficient	.039	-.113*	1.000	-.178**
		Sig. (1-tailed)	.242	.020	.	.001
		N	331	331	332	332
	Education	Correlation Co-efficient	-.029	.153**	-.178**	1.000
		Sig. (1-tailed)	.298	.003	.001	.
		N	331	331	332	332
*. Correlation is significant at the 0.05 level (1-tailed).						
**. Correlation is significant at the 0.01 level (1-tailed).						

Table 4: Demographic factors correlation to dependant variables (user adoption)

Table 5 show the strength of the relationships among the variables among in comparison to the dependant variable that is the user adoption of the e-government online service in the state of Pahang.

Correlations							
			User adoption	Mean_ usefulness	Mean_ ease_of use	Mean_ quality	Mean_ trust
Spearman's rho	User adoption	Correlation Coefficient	1.000	.772**	.475**	.422**	.463**
		Sig. (1-tailed)	.	.000	.000	.000	.000
		N	331	329	327	330	327
	Mean_ usefulness	Correlation Coefficient	.772**	1.000	.609**	.588**	.504**
		Sig. (1-tailed)	.000	.	.000	.000	.000
		N	329	329	326	328	325
	Mean_ ease_ use	Correlation Coefficient	.475**	.609**	1.000	.604**	.548**
		Sig. (1-tailed)	.000	.000	.	.000	.000
		N	327	326	328	327	324
	Mean_ quality	Correlation Coefficient	.422**	.588**	.604**	1.000	.620**
		Sig. (1-tailed)	.000	.000	.000	.	.000
		N	330	328	327	331	327
	Mean_ trust	Correlation Coefficient	.463**	.504**	.548**	.620**	1.000
		Sig. (1-tailed)	.000	.000	.000	.000	.
		N	327	325	324	327	328

** . Correlation is significant at the 0.01 level (1-tailed).

Table 5: Relationship between independent variables with each of the other variables.

From the data shown on Table 5, and based on Davis (1971) elementary survey analysis, each of the variables has significant relationship with each other and the strongest relationship is between perceived usefulness and the user adoption (0.772), the second strongest relationship is between perceived quality and user trust (0.620), while perceived usefulness and perceived ease-of-use carried the value of 0.609. However, mean perceived quality and the user actual adoption is said to be at a medium level only.

Correlation Coefficient	Strength of Linear Relationship
.70 – and greater	Very Strong
.50 - .69	Strong
.30 - .49	Medium
.10 - .29	Weak
.01 - .09	Non Existence

Source: Davis, J.A (1971). *Elementary Survey Analysis*. New York: Prentice Hall

Conclusion and Recommendations

Based on the above discussion, it was found that perceived usefulness, perceived ease-of-use, perceived quality of a website as well as perceived user trust do affect citizen adoption of e-government online service in Pahang. However, from the analysis, it can be concluded that users will certainly use e-government online service once they perceived that the system is useful to them. However, users do not really concern whether the online service system is easy to use, have high quality or trustworthy because most of them just use e-government online service basically to get information or download forms. The researcher feels that this is the reason for the lower value in their correlations to the adoption level. On the other hand, if the users use the online service to do online transaction such as payment of taxes or registering for a license, perhaps the value would be higher.

The demographic factors such as gender, age and education do not determine the level of online service adoption. This suggests that once the users perceived that the online service is useful thus, factors like ease-of-use, quality and trust become secondary to them. However, the more variety of usage the users need, the more significant these factors will become to them.

As a conclusion, the citizens of Pahang have a high adoption of e-government online service and it does not depend on gender, age and education. It is evidence that they prefer the online service to the traditional service (face-to-face). Users will perceive the system is useful to them when the website offers services and information important to them and it is practical for them to get them online rather than coming down to the office and see the official concerned. The online system saves a lot of time and cost to citizens as e-government service users. With interesting and complete website, attractiveness of the design also motivates them to use the system.

There are many studies conducted on online service system but most of them are at the national level. In order to uphold the national vision and mission of this country's e-government implementation and development, adequate attention should also be given to the state and local e-government as they too, form parts of the national level achievements. Hence, it is recommended that further studies should be conducted on each of Malaysia's state level of user adoption, barriers to adoption and the types of online service they would prefer to have online. This study should be conducted especially in the rural areas of each state in Malaysia as the government has given a huge sum of funds to develop the state ICT infrastructure in moving towards vision 2020.

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