E-GOVERNMENT ADOPTION IN DEVELOPING COUNTRIES: TRENDS IN THE USE OF MODELS

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Abstract

Like the evaluation of all other information systems initiatives, the evaluation of e-government in both theory and practice has proven to be important and complex. The importance of e-government evaluation is due to the enormous investment put in by governments for delivering e-government services and to the considerable pace of growth in the field of e-government. However, despite the importance of the evaluation of e-government services, the literature shows that e-government evaluation is still an immature area in terms of development and management. The main aim of this article is to explore various theories and models which have been used in the developing countries context to evaluate e-government adoption. Developing countries suffer from poor citizen utilization of e-government initiatives. An assessment of various theories and models for e-government adoption in developing countries may positively contribute to enhancing government understanding of the factors that influence citizen utilization of e-government systems. Moreover, the understanding of these models can be used as means for providing valuable feedback for the planning of future e-government initiatives in the developing countries.

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Introduction

The potential benefits of electronic government (e-government) as a means of improving provision of government information and services to citizens in developing countries have been widely acknowledged (Colesca and Dobrica 2008a: 205; Mofleh, Wanaous and Strachan 2008:3; Moon 2002:426-427; Wang and Liao 2008:718). Governments have been and still remain the single largest collectors, users, holders and producers of information (Ngulube 2004). Information remains the basic ingredient in developing countries in pursuing the political, economical, social and managerial activities.

Governments in both developed and developing countries have been making significant efforts to adopt e-government services to improve their efficiency and effectiveness of internal government operations, communications with citizens, and transactions with both individuals and organisations (Kumar *et al*., 2007:64). However, what differentiates the developed and developing countries is the extent of adoption. E-government adoption has shown positive trends in developed countries and negative ones in the developing countries (Avgerou 2008:137; Berman and Tettey 2001:2; Sang, Lee and Lee 2009:530). Evidence shows that developed countries are progressing faster in relation to e-government adoption than the developing countries.

According to Carter and Belanger (2005:5), the major role of e-government is to increase the convenience and accessibility of government information and services to citizens resulting into increased government accountability to citizens, greater public access to information and a more efficient, and cost-effective government. Citizens who use the internet for information gathering purposes are more likely to view access to government information as important (Cuillier and Piotrowski 2009:443; LaRose and Eastin 2004). Frequent users of online information may be disposed to wanting information about government, including government records, and therefore exhibit greater support for open records (Cuillier and Piotrowski 2009:443).

A lack of access to e-government information is a challenge that can impact on trust and thereby hinder e-government adoption. (Carter and Belanger 2005; Carter and Weerakkody 2008; Chircu and Lee 2005; Dimitrova and Chen 2006). Despite the importance of accessibility to information in influencing the citizen's perspective of e-government services, studies show that governments either ignore or pay little attention to the whole concept of information accessibility to their citizens (Alshawi and Alalwany 2009:199). Although accessibility to information is generally ignored worldwide, the situation is not exactly the same across some countries. For example, Terry Ma and Zaphiris (2003) revealed that the UK e-government Websites are rated relatively high in terms of information accessibility.

The factors that hinder e-government adoption in some other countries include (Gupta, Dasgupta and Gupta 2008:141; Kaaya 2004:42; Zarei, Ghapanchi and Sattary 2008:207):

- disparity in infrastructure development between urban and rural areas (the urban areas being favoured);
- poor electric power and telephone supplies;
- language barrier, (having English dominating the content which is only understood by a minority elite);
- uncoordinated e-government activities;
- low literacy levels among potential users;
- lack of technical expertise to support and maintain information and communication technology (ICT) infrastructure; and
- lack of computers.

There is thus a need for governments to pay enough attention to making information accessible to their people in order to succeed in e-government adoption.

In order to develop a citizen-centered e-government services that provide participants with accessible, relevant information and quality services government agencies must first understand the factors that influence citizen adoption of this innovation (Carter and Belanger 2005:5). Therefore it is important to investigate the factors that influence access to e-government information and e-government adoption in developing countries. Researchers in the field of information systems and technology have come up with theories and

models that explain factors for e-government adoption. The following are studies which have been carried out in developing countries using various e-government models showing e-government success factors and barriers.

E-government adoption models in developing countries

The DeLone and McLean Information System (IS) Success model has been successfully used to study IS in an e-government context (Scott, DeLone and Golden 2009). This model provides a multi-dimensional framework for studying and understanding the success of e-government websites from the perspective of citizens. Understanding success and the impact of IT quality on success can act as an invaluable framework for public sector managers in the evaluation of e-government initiatives and the development of future web-based services. This model establishes the net benefits in the evaluation of e-government success. There is a significant lack of research that identifies and analyses the benefits of using e-government services from the perspective of the citizens. This model extends knowledge of e-government success by examining the impact of IT quality constructs (i.e. information, system and service quality) on success measures (i.e. use, user satisfaction and net benefits). The influence of quality constructs on usage, satisfaction and net benefits is largely unclear. Various studies postulate significant relationships between IT quality constructs and success measures; however, the multi-dimensional and interdependent nature of e-government success remains untested (Scott, DeLone and Golden 2009).

Rokhman (2011) conducted a study in Indonesia to find out the level of acceptance of e-government using variables such as relative advantage, image, compatibility, and ease of use. This study used innovation diffusion theory (Rogers 1995) as main frame and merged it with perceived characteristics of innovation (PCI) (Moore and Belbasat 2001). The study proved that e-government is compatible with lifestyle and culture through testing the variable “compatibility”.

Lin, Fofana and Liang (2011) conducted a study to assess citizen adoption of e-government initiatives in Gambia. This study examined

the validity of Technology Acceptance Model (TAM) in the e-government setting in Gambia and focused on how Gambians behave differently. This study focused on citizen who used e-government systems to file applications or used e-government in their work. The findings of this study suggest that the core constructs of TAM have strong influences on citizens' intentions of using e-government systems. Both information quality and perceived ease of use positively influence the perceived usefulness of the Gambian e-government system. Furthermore, perceived ease of use significantly affected citizens' attitudes to use the e-government systems. In addition, it was found that attitudes toward using the e-government systems significantly affect Gambian citizen's behavioural intentions. Consistent with prior technology acceptance model literature, the core constructs of TAM (i. e. information quality, perceived usefulness, perceived ease of use, attitude towards using, and behavioural intention) had a significant and strong influence on Gambians' e-government usage intention. However, Gambians perceived usefulness was found to have a weak linkage with behaviour intentions and attitudes. This was due to Gambia's inconsistency and unstable electricity availability compared to the western world. Perceived usefulness does not have a strong impact on behavioural intentions and attitudes in developing countries with an underdeveloped information technology (IT) infrastructure.

Gupta, Dasgupta and Gupta (2008) on the other hand, explored ICT adoption to improve government and employee interactions in a government organization in a developing country. In examining adoption behaviour, the Unified Theory of Acceptance and Use of Technology (UTAUT) was used. It was revealed that performance and effort expectancy, social influence and facilitating conditions have a positive impact on the use of ICT. The UTAUT model is the largest model on technology acceptance and it has synthesized elements across eight well known technology acceptance models: the Theory of Reasoned Action (TRA), TAM, the Motivational Model (MM), the Theory of Planned Behavior (TPB), the combined TAM and TPB, the Model of PC Utilization (MPTU), the Innovation Diffusion Theory (IDT) and the Social Cognitive Theory (SCT). The UTAUT model is appropriate in explaining the use of ICT in government organisation (Gupta, Dasgupta and Gupta 2008:145). In addition, the UTAUT model has only been used to examine e-government adoption in the

organizational environment. Two of its six variables rely heavily on the technology being introduced in an organization. Some of the criteria suggested to measure “social influence” include help of the senior management, and organizational support for the new technology (Colesca and Dobrica 2008b:141).

Similar to Gupta, Dasgupta and Gupta (2008), Al-Shafi and Weerakkody (2010) employed a UTAUT to explore the adoption of e-government services in the state of Qatar. The results reveal that effort expectancy and social influences determine citizens’ behavioural intention towards e-government. Moreover, facilitating conditions and behavioural intention were found to determine citizens’ use of e-government information and services in Qatar.

Another study by Colesca and Dobrica (2008a) was conducted to identify factors that could affect the citizens’ adoption of e-government services in Romania. The findings of this study indicate that citizen’s higher perception of usefulness, ease of use, quality and trust of e-government information and services directly enhance their satisfaction and in turn the level of adoption of e-government. The study recommended that awareness campaigns should be conducted to inform potential users of the benefits of e-government for an effective adoption of e-government services. TAM was modified to suit the characteristics of this research and was utilized in this study.

Siau and Long’s (2005) stage model is a combination of Gartner’s four-stage model, UN’s five-stage model, Delloitte’s six stage model, Layne and Lee’s (2001) four stage model and Moon’s (2002) model. The advantages of this model are firstly, the combination is comprehensive as it covers the main ideas from different models. Secondly, the model combines different perspectives such as technology, organization, management and politics. For example, the Layne and Lee (2001) four-stage model does not consider the improvements of political development and democracy, which are the main visions of e-government. According to Siau and Long (2005:457) the synthesized stage model can be used to collect quantitative data or qualitative data to evaluate the e-government’s development level based on the stage model. This model can be used to investigate possible factors (for example, information and computer technology, human development situation, economics,

culture and political environment) as they influence e-government development stages. This model can be used to assess the current status and the factors for e-government adoption in developing countries (Chatfield and Alhujuran 2009).

Bwalya and Healy (2010) examined two cases from Zambia where ICT has been used in support of e-government initiatives. The study proposed a model which resulted from a combination of the models of Wangpipatwong, Chutimaskul and Papasratorn (2008) and (Davis 1989) that had been tested elsewhere (Bwalya 2009:29). The attributes in this model are: user characteristics (perceived risk, perceived control, and internet); website design (perceived usefulness, perceived ease of use); service quality; and client satisfaction and culture awareness and the need to improve on the ICT infrastructure for the information to be easily accessible. The findings of this study revealed that lack of adequate ICT infrastructure and political will, provision of information in English other than local languages, lack of proper change management procedures hinder appropriate e-government adoption in Zambia.

Another study by Alomari, Sandhu and Woods (2009) examined the social factors that may influence citizen's intention to use e-government. These factors were examined through literature search, and questionnaire. The research explored four different social factors which are: trust in relation to security and privacy and trust in government, attitudes and beliefs, education and accessibility. Accessibility was used in this study as a factor which may influence e-government adoption due to the fact that it influences the citizens' experience with websites and their satisfaction and adoption of new technology. The study derived these factors from TAM, DOI and the literature on social factors in order to refine the main social factors influencing e-government adoption in Jordan. The results indicated that accessibility, beliefs, perceived usefulness, complexity, and trust in e-government are the factors that may influence e-government adoption in Jordan.

E-government adoption models and human behaviour

A citizen centred e-government implies that governments know what citizens want from e-government, and want to meet citizen

expectations and needs. For this reason governments focusing on citizen centered e-government actively seek to discover what citizens want from e-government. It is thus essential to investigate citizen information needs and factors which influence citizen attitudes and behaviour towards e-services. Information behaviour focuses on people's information needs; on how they seek, manage, give, and use information, both purposefully and passively, in the varied roles that comprise their everyday lives (Julien, Pecoskie and Reed 2011: 19). In marketing a core principle is to satisfy consumer needs (Rosenbloom and Dimitrova 2011: 53). However, in e-government context, most studies have focused on adoption models such as TAM or TPB, forgetting citizens' needs, demands or expectations. There is not enough research that has been conducted to explore the relationship between human behaviour and information systems design (Spink and Cole 2005: 25). Information system designers have concentrated on human factors, but have not taken human behaviours, into account when designing information systems (Keshavarz 2008). Information seeking behaviour is an important factor in information system design due to the fact that information seekers with information needs use information systems to solve their problems (Spink and Wilson 1999).

Models of information-seeking behaviour and e-government adoption

Models of information-seeking behaviour are based almost entirely on research conducted in Western countries, and were generated at a time when electronic methods of information-seeking were still uncommon. Al-Suqri (2011) developed an integrated model of social science information-seeking behaviour based on a synthesis of established models and tests the ability of this integrated model to describe present-day information-seeking among social science scholars in a Middle Eastern university. The specific stages of information-seeking used in the synthesized model are drawn from both (Ellis' 1989) information-seeking model and (Kuhlthau's 1991) information search processes model. The research was based on e-mail interviews, face-to-face interviews and focus groups conducted with social science faculty at Sultan Qaboos University in Oman. The findings of the study indicated that the information-seeking practices of the study sample could be readily matched to the stages of the

model. The suggestion is that, in general terms, information-seeking behaviour follows universally applicable stages, and that the model can be applied to current day information-seeking despite changes in the information environment. The research also generated a range of findings relating to the location and format of resources and perceived barriers to effective information seeking, which are likely to be of value to the field of knowledge in library and information science and the ongoing refinement of models and theories of information-seeking.

Belanche, Casalo and Flavian (2010) analysed how confirmation of citizens' expectations may influence perceptions and behavioural intentions in the e-government context. The study was a web survey. When potential participants in the survey entered the website they found the research questionnaire and additional information about the Project. The findings revealed that confirmation of expectations and perceived usefulness effectively predict citizens' intention to use online public services. As well, positive word of mouth among citizens is positively affected by confirmation of expectations and intention to use these services. Finally, confirmation of expectations reinforces its importance by influencing perceived usefulness too. It was further recommended that for e-government to be successful, citizen expectations and perceived usefulness on the public services should be improved. That will promote citizens' intentions to use and recommend online public service.

Conclusions and lessons learned

There are several models that can be used to study e-government adoption in developing countries. Since the main enabler of e-government is technology, the base models usually come from technology adoption studies (Davis 1989) Other models such as UTAUT model and DOI model have introduced additional constructs on top of those of TAM. However, a general evaluation of each model reveals that similar constructs can be observed in each model under different names.

Davis (1989) developed TAM and showed that perceived ease of use of the technology characterized the beliefs that lead to system usage. In DOI theory, Rogers (1995) identified five constructs that influence

a potential adopter's decision as follows: relative advantage, complexity, compatibility, trialability and observability. Relative advantage refers to the belief that a new system has benefits above and beyond the current system. Complexity refers to perceptions of difficulty associated with adopting a system. Compatibility posits that one is more likely to adopt an innovation if it is consistent with their values, views, beliefs, and customs. Trialability posits that one is more likely to adopt an innovation if it can be tried out before actually committing to it. Finally, observability suggests that one is more likely to adopt an innovation if its benefits are visible and tangible. TAM constructs are included in the DOI model. Perceived ease of use is represented by complexity and perceived usefulness is captured by relative advantage. On the other hand, the three constructs of UTAUT have a direct effect on usage intentions (i.e. effort expectancy (complexity), performance expectancy (relative advantage) and social influence (Venkatesch *et al*., 2003). Social influence is defined as the degree to which an individual believes others think they should use a new technology.

DeLone and McLean model has also been found to be a useful framework for organizing IS success measurements. The model provides a base for understanding e-government success by examining the impact of IT quality constructs.

According to Chatfield and Alhujuran (2009), Siau and Long's (2005) model can be used assess the current status and the factors for e-government adoption in developing countries. The Siau and Long (2005) proposes information and computer technology, human development situation, economics, culture and political environment as factors which affect e-government adoption as they influence e-government development stages.

Human factors should be taken into account when designing information systems. Information-seeking behaviour follows universally applicable stages, and that the information-seeking behaviour model can be applied to current day information-seeking despite changes in the information environment. Models of information seeking behaviour suggest that information-seeking behaviour arises as a consequence of a need perceived by an information user who in order to satisfy that need, make demands

upon formal or informal information sources which result in success or failure to find relevant information (Wilson 1999). Thus, the model of information-seeking behaviour can enable the information content developer to specify more clearly what navigational routes are needed through the information and the kind of information which needs to be in the record (Wilson 1999). Such an approach may assist in developing e-government platforms that appeal to the citizens.

Moreover, social factors may as well influence citizen's intention to use e-government. The social factors are; trust in terms of security and privacy and trust in government, attitudes and beliefs, education and accessibility. It is thus important to use a combination of models which results in complementary strength and non overlapping weaknesses.

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