

Individual Acceptance of e-Government: A Literature Review

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ABSTRACT

In order to develop more acceptable e-government services, government needs to understand the factors influencing citizens to use the services. This paper reviews prior studies on acceptable e-government services and accepting users of e-government services. Demographic characteristics of the users, the impact of culture, and the psychological factors for using e-government services are discussed. By understanding and measuring the adoption factors, government may predict acceptance of a new e-government service, evaluate an existing e-government service, and improve acceptance of the service by defining and running management strategies.

KEYWORDS

e-government, individual acceptance, adoption factors, literature review.

1 INTRODUCTION

This study refers to *e-government* as the use of information and communication technologies (ICT) to provide government information and public services to citizens (G2C), businesses (G2B), and government employees or other government organizations (G2G) [1]. It includes all ICT platforms and applications such as internet, telephone, fax, and mobile technologies.

While the topic of e-government adoption is new and emerging in the adoption pattern area, most of the existing studies have focused upon the supply side or government related issues such as strategies and policy, challenges, technical issues, and evaluation of the usability of e-government

websites. Little attention has been given to the demand or citizen's perspective [2,3,4].

In fact, understanding of the determinants of e-government adoption from the citizen's point of view is essential in order to develop citizen-centric e-government services that are more acceptable to citizens. A citizen-centric e-government is an e-government service that gives top priority to the citizens and serves them as customers. Such services are designed to anticipate and address the needs of individual citizens on a one-to-one basis [5]. Deloitte and Touche's [5] study across 250 state-level government departments in Australia, New Zealand, Canada, the United Kingdom, and the United States of America showed that citizen-centric e-government achieved much greater success in user acceptance and other critical performance areas. This includes nearly 50% more success in increasing service volume, providing easier customer access, getting better information on operations, reducing employee complaints, reducing employee time spent on non-customer activities, and improving the government image.

In order to develop citizen-centric e-government services that are more acceptable, government agencies must first understand the factors that influence citizens in the adoption of the services. To this end, this study recommends looking at two perspectives: understanding what makes e-government services acceptable and understanding the characteristics of the users that actually adopt and use e-government services. This paper reviews the types and characteristics of acceptable e-government services and of the adopters of e-government with respect to demographics factors, culture and psychological factors.

2 ACCEPTABLE E-GOVERNMENT SERVICES

Current studies reveal that, in terms of acceptable e-government services, informational services are used more than communicational, transactional, or two-way services [6]. Thomas and Streibs' [7] study, conducted in the state of Georgia, suggests that citizens mostly used e-government for obtaining information (64%) and getting contact information (47%) rather than sending a service request (36%), complaining (30%) and expressing opinion (14%). Similarly, Taylor Nelson Sofres Plc found that the main use of e-government services is for information seeking, following by downloading forms that were then sent by post or fax (such as tax or rebate forms), providing personal information to the government, paying for government services using credit card or bank deposit (such as car registration, traffic fines, or recycle bins), and consulting with government [4]. In a number of societies most e-government users do not require high level integrative services, they prefer basic informative government services [7,8]. eGovernment services for providing information are more likely to be accepted than two-way services.

Moreover, in order to be accepted, the information should be relevant to the specific needs of the citizen. For example, a survey across six countries (United States, Spain, Singapore, United Kingdom, Canada, and Australia) showed that information about an office address or a list of services offered by an agency is the most popular type of information for e-government use [9]. In the United States, tourism or recreation information is another popular type of information, following by information about road closures due to weather, health information from the government agency responsible, and the voting records of elected representatives. In terms of transactional services, Americans were interested in using e-government services for changing their addresses, responding to jury summons, renewing their driving license, applying for a birth certificate or marriage license, submitting personal information to determine eligibility for government programs, applying for passport/visa,

unemployment, business permits, government jobs, student financial aid, and filing taxes [9]. Since a citizen's needs for e-services differs across government agencies, a government agency should first conduct up-front research on those needs so as to deliver e-government services that are actually desirable.

3 ACCEPTING USERS OF E-GOVERNMENT SERVICES

Existing studies in e-government have investigated external and internal factors related to adopters. The external factors included demographics and culture, while the internal factors explored mental attributes of the e-government adopters.

3.1 Demographic Characteristics

Prior research indicates that demographic characteristics may have an imperative role in the adoption of e-government services. Income and education were positively related to the use of e-government services, while age was negatively related to adoption [3,10].

In the United States, "four in five (80%) e-government users are Caucasians, seven in ten (68%) are under age 50, nearly half (47%) hold at least a four-year college degree, and 44% earn household incomes of at least \$50,000" [9]. In the UK, the majority of the adopters were between the ages of 25 and 54 years and were educated to the undergraduate or postgraduate levels. Also, the higher the income the more probable it is for an individual to adopt e-government services [3].

In terms of *gender*, studies in Turkey and the UK showed that there were more males than females accessing e-government services. However, in the United States and Kuwait, studies revealed that a gender gap was not evident [3,9,11,12].

In general, a demographic profile of an e-government adopter is one who is likely educated, young (under 50 years old) and has high income. Choudrie and Dwivedi [3] suggested that adopters of e-government services in the UK are likely male, 25-54 years old, have high educational level

(undergraduate or postgraduate) and high income. Similar to this result, Thomas and Streib [7] suggested that e-government users tend to be white, have a higher income, are more educated than other Internet users, and are young. Hart and Teeter [9] also reported that young adults, whites, college graduates, and professionals were likely to accept e-government services. Citizens with home broadband access are more likely to be aware of and to adopt e-government services [3]. This finding may also explain why the majority of e-government adopters are individuals with high income, particularly in developing countries where broadband internet access is still expensive.

3.2 The Impact of Culture on e-Government Adoption

Some current studies on e-government adoption have considered whether culture (both national and organizational culture) has a significant influence on an individual's behaviour in accepting or rejecting e-government services. The different findings on the presence or absence of a gender gap in e-government adoption between studies in Turkey and in the United States, for example, was believed to be due to the difference of 'cultural tendency' particularly the communication styles of men and women [12].

Power distance and uncertainty avoidance — two cultural variables — were proposed as determinants for e-government adoption [13]. *Power distance* is defined as the individual's perception about the existence of distance between lower and upper castes in his/her society, while *uncertainty avoidance* refers to the tendency to be risk averse. Warkentin et al. [13] argued that citizens in countries with a higher power distance are more likely to adopt e-government than are citizens in countries with a lower power distance. Citizens in cultures that have higher uncertainty avoidance would be more dependent on trust for e-government adoption.

However, Kovacic's [14] analysis of data from 95 countries suggests that the government of a country with a larger power distance would have a negative attitude toward increasing the level of e-government readiness. He supports the

relationship between culture and e-government adoption at a national level by suggesting two cultural factors: *individualism* and *power distance*. The *individualism* refers to the relationship between the group and the individual in a society. The government with a strong individualistic culture is likely to have a positive attitude toward increasing the level of e-government readiness. Between the three cultural factors, Bouaziz [15] found that *individualism* and *uncertainty* have important influence, but the *power distance* has lower impact on e-government adoption.

In contrast, Kortemann's [16] study on the effects of cultural background on the acceptance of ICT in developing countries revealed that even though culture has a significant relationship with *perceived usefulness*, *perceived ease of use*, *perceived resource* and *attitude*, it does not influence actual use. Culture could be a moderator of individual's beliefs towards using e-government services. This study used two groups of samples: 107 respondents from India and 25 respondents from the Netherlands.

3.3 Psychological Forces for Using e-Government Services

Another approach in understanding user acceptance of e-government services is to investigate what psychological forces exist behind individual's actions, thoughts, or behaviour towards deciding to use e-government. The theory of reasoned action [17] suggests that human behaviour towards a technology (including using or rejecting e-government services) is basically influenced by his/her beliefs about using the technology. By understanding the psychological factors, e-government practitioners, researchers and governments may measure the degree of acceptance of an e-government service, evaluate the system and the service from the perspective of the user, and define a better set of strategies that promote greater acceptance of the services.

Present studies on psychological factors of e-government users suggest that an individual's attitude towards use, social pressures, and perceptions about the services, the technology, and the service provider (government agency) could

influence the acceptance of e-government services.

Studies which adopted the TAM and the UTAUT models have verified that *perceived usefulness* (or performance expectancy) and *perceived ease of use* (or effort expectancy) are major influences on the intention to use or to not use an e-government service [2,10,18,19,20]. The TAM was commonly chosen due to its popularity while the UTAUT was developed from eight prominent models. However, the original context of the TAM and the UTAUT models were developed for user acceptance of information technology in a work organizational context whereas e-government services exist in a daily life context. Thus, *perceived usefulness* of e-government services may relate to the extent to which the services fulfil a citizen's daily life needs and meet their interests instead of improving job performance. The benefits may cover the cost and time efficiency, and convenience of accessing public service by using the e-government services compared to physically coming to a government agency's office [19]. The studies suggest that the higher an individual's *perceived usefulness* of an e-government service and the easier the service is perceived to be by the person the more likely he/she uses the service.

Other perceptions that play important roles in user acceptance of e-government services are *trust* and *perceived risk* [21,22]. In an uncertain environment like the Internet, *trust* and *perceived risk* are theorized as direct determinants of intention to use e-government services. An individual may weigh the benefits and the risks in using an e-government service [21]. Perceptions about risk in using e-government services may include concerns regarding privacy, financial, and security [23]. Therefore, Dimitrova and Chen [10] suggest that the *perceived risk* tolerance of an individual may determine his/her decision to use or to not use an e-government service, particularly for transactional use. *Perceived risk*, however, could be reduced by the increase of *trust* in the technology (Internet and the infrastructure) and the service providers (including the government agency, the Internet service provider, and the

financial institution) [18,21]. A high level of trust in the service, the technology, and the service provider may lead to a low *perceived risk* in using the service and increase intention to use the e-government service [2,10,19,22].

Adopting the core constructs of the TAM, the DOI theory and trustworthiness factors in e-commerce, Carter and Belanger's [18] study also verified the significant influence of *perceived ease of use* and *perceived trustworthiness* on *intention* to use. They suggested another significant factor: *compatibility*. The model was validated using the Department of Motor Vehicles (DMV) and the Department of Taxation (TAX) online systems in the state of Virginia. The final model suggests that the intention to use an e-government service increases if citizens perceive the service to be *easy to use* (for example, the website is easy to navigate, the information is organized and presented based on citizen's needs allowing users to quickly and effortlessly find the information/services they seek), the service is *congruent* (compatible) with the way citizens like to interact with others and consistent with other ways citizens have dealt with the government (for example, online forms should resemble paper forms, any fees should be economical, there is a standard and familiar interface for all agencies' web sites), and the citizens *trust* both in the government and the technology (the government provides and advertises online security, competent employees are present in citizen-centred information/service, and there is a high response rate to any enquiries). Among the factors, the *compatibility* was found to be the most significant determinant in acceptance of e-government services.

Another study on user acceptance of e-government adopted the decomposed theory of planned behavior (DTPB) [24]. The study used the online tax filling and payment system (OTFPS) in Taiwan as an object and involved 1,099 taxpayers out of a sample of 8,500 registered taxpayers. The DTPB was considered to be an appropriate reference model since the acceptance of e-government services is not entirely under a citizen's control and present constraints can inhibit

both the intention and the actual usage; citizens tend to be influenced by external and interpersonal influences in accepting e-government services; and individual's self-efficacy and facilitating resources are possible barriers to the adoption of e-government services. The proposed model was able to explain the considerably high variance (72%) in intention to use e-government services. As in the original DTPB model, the proposed model suggests that *intention* towards using e-government service is determined by three main constructs: *attitude towards use*, *subjective norms*, and *perceived behavioural control*. However, in the context of e-government service, Hung et al [24] decomposed *attitude* into five underlying beliefs (i.e. *perceived usefulness*, *perceived ease of use*, *perceived risk*, *trust*, and *personal innovativeness*), the *subjective norms* into two underlying beliefs (i.e. external influence and internal influence), and *perceived behavioural control* into two underlying beliefs (i.e. *self-efficacy* and *facilitating conditions*). The final model verified that an individual's intention towards using e-government services is largely influenced by *attitude* along with a relatively small proportion of *subjective norm* and *perceived behavioural control*. Among the underlying beliefs, *perceived usefulness*, *compatibility*, *trust*, *interpersonal influence*, and *self-efficacy* are more important than the others. The model of Hung et al is presented in Figure 1.

The significant effects of *perceived ease of use*, *perceived usefulness*, *trust*, and *social influence* on user acceptance of e-government services were also confirmed by Gefen et al.'s [25] study. However, they suggest a different relationship among the factors. Their study suggested that *trust*, *social influence* and website *ease-of-use* impact *perceived usefulness* of the interface, which was combined with *social influence* to predict *usage intention* of e-government.

In order to account for the limited accessibility of ICT in developing countries, Philip's [26] study added the TAM with the *individual's perception of socio-economic environment* and *accessibility of technology to individual*. It is based on the arguments that in developing countries where

universal access to technology is not available, the adoption is not about choice. "The value given to ICT artefacts by individuals (*perceived usefulness* and *perceived ease of use*) is greatly influenced by many external factors, particularly the unavailability of resources and other pressing basic needs". The *accessibility of technology to individual* is defined as the technology that is in place and available for use by the user. It refers to the maturity and exposure of a user in the use of the technology over time as well as the existence of the infrastructure. The *individual's perception of socio-economic environment* refers to the user's perception of the national development in social economic development in various areas such as health, democracy, physical environment, education, and employment. The study used the *perceived user resource* (PUR) model [27] as an extension of TAM and links to national socio-economic development and technological infrastructure factors. The proposed model was validated by 198 respondents from two organizations in Nigeria and another two in Kenya. The model postulates that *perceived usefulness*, *perceived ease of use*, and *perceived resource* are influenced by external variables including *accessibility of technology to individual*, *individual's perception of socio-economic environment*, *perceived negative-impact factors*, and *perceived positive-impact factors*.

Awadhi and Morris [11] adopted the UTAUT model in a study in the context of developing countries. The UTAUT model contains five direct determinants of use behaviour: *performance expectancy*, *effort expectancy*, *peer influence*, *facilitating conditions* and *behavioural intention*. In the study by Al Awadhi and Morris [11], *performance expectancy* was measured in terms of an individual's perception of benefits derived from using e-government services such as saving time, money and effort, facilitating communication with government, improving the quality of government services and providing citizens with an equal basis on which to carry out their business with government. The *effort expectancy* was measured by individual's perceptions on whether the service is easy to use and easy to learn. The *social influence* was represented by peer influence since

the sample was young students who tend to connect with people their own age to share attitudes, interests, and circumstances. The *facilitating conditions* was measured by the perception of being able to access required resources, as well as to obtain knowledge and support needed to use e-government services. Finally, the *behavioural intention* was represented by intention, prediction and planned use of e-government. Instead of including four moderators as in the original UTAUT (i.e. gender, age, experience, and voluntariness of use), this study defined three moderators: gender, academic course, and Internet experience. The proposed model was validated by 1013 undergraduate and postgraduate students taking scientific and humanities courses in Kuwait. The experience was represented by Internet experience and academic course, while the age and voluntariness were deleted since participants were of a similar age and the use of e-government services is highly voluntary. This study suggests that *performance expectancy*, *effort expectancy*, and *peer influence* significantly influence on *usage intention* of e-government services, while *facilitating conditions* have a direct effect on *actual use* of e-government services. The effect of *performance expectancy* on *behavioural intention* of using an e-government service increased with greater Internet experience. The effect of *effort expectancy* on *behavioural intention* is also moderated by Internet experience. Once Internet experience increased, *effort expectancy* became less important. This relationship was also moderated by the type of academic course taken by the respondents; for students of scientific courses, the *effort expectancy* became less important for their *behavioural intention*. The peer influence was significant when the user had limited experience of online services. Both *behavioural intention* and *facilitating conditions* were found to be significant for individual's use of e-government services. However, the study did not find any significant gender influence in the relationship between *performance expectancy*, *effort expectancy*, and *peer influence* with the *intention* to use e-government services. The absence of gender difference in the study was argued to be due to the

sample of students having similar education and learning opportunities.

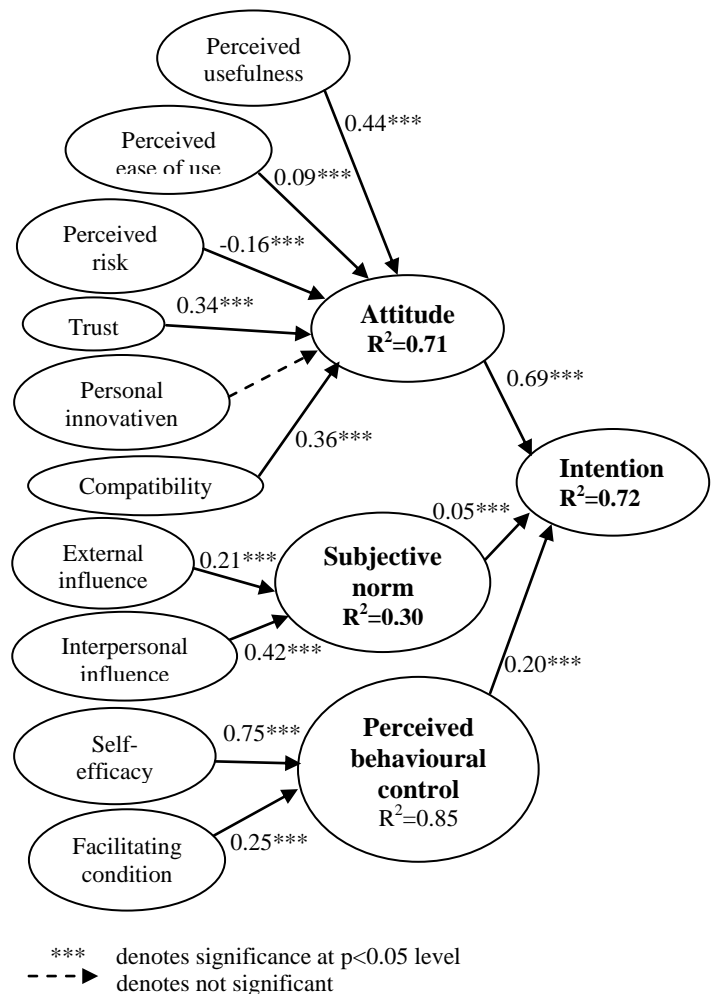


Figure 1. User acceptance model of e-government suggested by Hung et al. [24]

In a case study of e-government adoption in Jordan, as a developing country, Mofleh and Wanous' [28] study proposed *compatibility* with e-government, *trust in Internet* and *trust in government* as significant variables that increase a citizen's demand on e-government services.

Table 1 summarizes the e-government adoption factors suggested by the present studies.

Table 1. User acceptance determinants of e-government services

Factor (s)	Definition	Example studies
<i>Attitude towards use</i>	The degree to which a person has a favourable or unfavourable evaluation of using an e-government service (adopted from TRA and TPB).	[10,24,29]
<i>Perceived ease of use, effort expectancy</i>	The degree to which an individual expects that using an e-government service to be free of effort (adopted from TAM and UTAUT).	[2,26,18,24,11,20,30]
<i>Perceived usefulness, performance expectancy</i>	The degree to which a user believes that using an e-government service will fulfil his/her needs (adopted from TAM and UTAUT).	[2,10,11,20,21,22,23,24,25,26,30,31,32]
<i>Perceived risk, perceived uncertainty, trust</i>	The extent to which an individual trusts the government agency and the technology and believes that using the service will not cause problems for him/her.	[2, 10, 21, 24, 18, 19,22,,25, 29, 28, 32]
<i>Perceived compatibility</i>	The degree to which an individual perceives that an e-government service fits with his/her existing values, previous experience and current needs (adopted from DOI).	[18, 24, 28,33]
<i>Perceived quality of the information</i>	The degree to which an individual perceives that the information provided by an e-government service is valuable, accurate, up to date, and relevant for the users' needs.	[19,30]
<i>Perceived behavioural control</i>	The perceptions of one's ability to use an e-government service (adopted from TPB).	[21, 24]
<i>Perceived resources, facilitating conditions</i>	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of an e-government service (adopted from DTPB and UTAUT).	[26, 11, 24,31]
<i>Self-efficacy</i>	Individual's self-confidence in his/her capability to use an e-government service (adopted from DTPB)	[20,24]
<i>Social norms,</i>	The perceived social	[11,24]

<i>interpersonal influence, peer influence</i>	pressures to perform or not to perform the behaviour of using an e-government service (adopted from TRA and TPB).	
<i>Relative advantage</i>	The degree to which an e-government service is perceived to be providing benefits better than its precursor including economic benefits, image enhancement, convenience, or satisfaction (adopted from DOI).	[33]
<i>Prior interest in government</i>	An individual's interest and experience in the use of government service	[10]
<i>Personal experience</i>	Individual's experience in the use of e-government services.	[21,28,29]
<i>Culture: individualism, power distance, uncertainty</i>	<i>Individualism</i> is the relationship between the group and the individual in a society. <i>Power distance</i> is the extent to which a society accepts differences and inequalities in power distribution among individuals, organizations, and institutions. <i>Uncertainty</i> is the attitude toward the risk, the uncertainty, and the new phenomena	[14,15]
<i>Demographics factors: Age, gender, education level, income</i>	Demographics factors of individuals	[3,9,10]

4 CONCLUSIONS

The present literature suggests that an individual's acceptance of e-government services is mainly determined by the person's *attitude* towards using the service and his/her perceptions about the services, the service providers (including the government agency, the financial institution, and telecommunication operator who provides the service), opportunity and his/her ability to use the services, and social expectations towards using or not using the services. However, the relationships between *attitude* and the perceptions with *usage intention* and *usage behaviour* can be moderated

by characteristics of the services and the individual's demographic factors and national culture.

By measuring the perceptions and *attitude* towards using an e-government service and understanding the characteristics of the service and the demographics and culture of the citizens, a government agency may predict acceptance of a new e-government service, evaluate an existing e-government service, and improve acceptance of the service by defining and running management strategies.

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