

# Towards a UTAUT-based Model for the Study of E-Government Citizen Acceptance in Saudi Arabia

Alzahrani.M.E, Goodwin.R.D,

**Abstract**—Among the most fundamental prerequisites for the successful development of electronic Government Services (e-Government) is Citizen Acceptance. Based on the UTAUT model, the paper describes a hypothetical framework that integrates the unique features of E- government to improve our understanding of the acceptance and usage of e-Government Saudi Arabia. The proposed model, based on UTAUT, includes the characteristics of E-government, consideration and inclusion of trust, privacy, and Saudi culture and context.

**Keywords**—E-Government; Technology Adoption; Citizen Acceptance; unified theory of acceptance and use of technology (UTAUT)

## I. INTRODUCTION

RAPID technological development in the current era forces governments, particularly those in the non-industrialized countries, to investigate and adopt technical solutions. E-Government is defined as conducting the various government transactions via the electronic network. Although the adoption of e-Government is potentially a route to the provision of better services delivered to citizens and a lower cost, there are acceptance problems associated with it. The question of people's acceptance or rejection of new information technology is among the most important of all in Information Technology (IT) and Information System (IS) research [1].

Achieving the objectives for e-government programs, services, transactions and the success of such innovations depends mainly on the interaction of citizens with such technology [2]. The problem of low-level of citizen adoption of e-Government services is still facing most governments in developing countries today [3-8].

This low rate of e-Government adoption is particularly noticeable in Saudi Arabia. Therefore, empirical research in this area is significant, since it is likely that it will shed light on the important predictors that may influence the future adoption of e-Government services. Identifying such factors will improve the adoption rate of these services, by deepening the knowledge about the factors which facilitate or hinder the adoption process. Although the literature reports a number of studies on e-Government adoption conducted in developed countries, there is a lack of empirical e-Government adoption research on the Middle East including Saudi Arabia.

Saudi Arabia is one of developing countries and is used as the case study in this research. The reason for selecting Saudi Arabia is that the country is representative of the Arab and Islamic states from a cultural perspective and the Gulf States from an economic one. Saudi Arabia has made great progress in its readiness for e-Government.

Mohammad Alzahrani is with Flinders University, Australia, e-mail : meawz27@gmail.com

The UN Global e-Government Survey 2010 ranked Saudi Arabia as number 58 worldwide. This was an improvement as demonstrated by its advancing 12 positions since 2008.

The technology acceptance models were first designed and tested in industrialized countries which are predominantly of Western culture. This study will investigate an appropriate change to the information technology adoption models and theories in order to advance an appropriate new theoretical framework and associated models for E-Government in Saudi Arabia. The objective of this paper is to present a proposed model to understand and explain more about the acceptance and use of e-Government among the citizens. This study will aim to achieve this by basing itself on a review of the unified theory of acceptance and use of technology (UTAUT) from the perspective of a Saudi Arabian context.

## II. TECHNOLOGY ADOPTION

Agarwal [9] defines technology adoption as the use, or acceptance of a new technology, or new product. In Information Technology and Information System (IT/IS) research, numerous theories are used to understand users' adoption of new technologies. Various models were developed including the Technology Acceptance Model (TAM)[10], Theory of Reasoned Action (TRA)[11], Theory of Planned Behaviour (TPB) [12], and recently, the Unified Theory of Acceptance and Use of Technology (UTAUT) [13]. Each of these models has sought to identify the factors which influence a citizen's intention or actual use of information technology.

### A. Theory of Reasoned Action (TRA)

TRA [11, 14] is well-accepted model already applied successfully to explain behaviour across a wide variety of settings [15-18]. Under TRA, the behaviour of a given is best predicted through their behavioural intentions that, in turn, is determined by the person's attitudes and subjective norm (social influence) [14]. Behavioural intention is a reference to the strength of a person's intention to adopt a certain behaviour [17]. Subjective norm is defined as beliefs about what others will think about the behaviour [14]. That is, if someone believes those who are significant to him perceive the outcome of performing the behaviour as positive, they will be more likely to perform the behaviour. The main shortcoming of the TRA is that it assumes individual behaviour is controlled volitionally [12] which is not always the case. Some people have little control or think they have little control of their behaviours.

### B. Theory of Planned Behaviour (TPB)

TPB goes beyond TRA and incorporates a further construction, specifically perceived behaviour control (PBC); this accounts for those situations where control over the target behaviour is not fully volitional. [19]. TPB is considered as to

be among the more influential of the theories in predicting and explaining behaviour [20]. Various studies showed the applicability of TPB to various domains, and verified the ability of this theory in providing a valuable framework to explain and predict the accepting of new information technology [21]. The new construct PBC was defined as the "perception of ease or difficulty of performing the behaviour of interest" [12:183]. Under TPB, the explanation of a person's behaviour lies in their behavioural intention; this is influenced by perceived behavioural control, attitude and subjective norms. Perceived behavioural control describes the perceptions an individual has regarding the absence or presence of the resources required or requisite opportunities to perform the target behaviour. Attitude refers to the negative or positive way the individual evaluates the performance effect of a given behaviour. The subjective norms are an individual's perceptions of how others will view their performance of a given behaviour.

### *C. Technology Acceptance Model (TAM)*

With the TRA as its starting point, TAM was proposed for explaining and predicting users' acceptance of IT and IS systems by assuming that the constructs - perceived usefulness (PU) and perceived ease of use (PEOU) - are the key determinants of IT and IS acceptance behaviour. Davis [10:320] defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance", while ease of use is "the degree to which a person believes that using a particular system would be free of effort". Fishbein and Ajzen [14:216] define behavioural intention as "the strength of one's intention to perform a specified behaviour". Under the TAM, both ease of use and usefulness have a significant impact on attitudes towards the use of a system either positively or negatively. To summarize, TAM specifies that PEOU and PU affect behavioural intention to use a system, which then determines actual use.

TAM is criticized for ignoring the social influence on technology adoption [22, 23] social and human factors. Venkatesh and Davis [24] extended TAM by integrating social and cognitive variables such as experience, job relevance, image, and voluntariness. This extended model is referred to as TAM2.

Overall, because of its simplicity and more practical theory, TAM has been tested broadly and commonly accepted [5]. At the same time several researchers have added their extensions to the model or integrated factors from other models. Hence, it cannot be said to be an all-encompassing model that can be used for all studies. Modifications may have to be made as and when necessary depending upon the subject, the size of the research or the duration of the study.

### *D. Unified Theory of Acceptance and Use of Technology (UTAUT)*

UTAUT was created by Venkatesh et al. [13] who synthesised existing models in an attempt to arrive at a comprehensive understanding than offered by any single model alone could. They merged eight existing IT/IS adoption theories and technology acceptance models into an integrated model. These eight models are the theory of reasoned action

(TRA); the technology acceptance model (TAM); the motivational model (MM); the theory of planned behaviour (TPB); a model combining the theory of planned behaviour and the technology acceptance model (C-TAM-TPB); the model of PC utilisation (MPCU); the innovation diffusion theory (IDT), and the social cognitive theory (SCT). All eight models are aimed at predicting and explaining user behaviour through the use of a range of independent variables. The unified model was constructed based on the empirical and conceptual commonalities among the eight models. According to UTAUT, the core determinants of users' acceptance and usage behaviour include a number of factors as illustrated in Fig4: Performance expectancy, defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance"[13:447]. Effort expectancy, defined as "the degree of ease associated with the use of the system" [13:450]. Social influence, defined as "the degree to which an individual perceives that important others believe he or she should use the new system" [13:451]. Facilitating conditions, defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system" [13:453]. Moreover, in the UTAUT model there are moderating factors of voluntariness of use, age, gender, and experience.

### *E. Advantages of UTAUT model*

The UTAUT model informs understanding of factors which influence acceptance of an important new technology. Even though the UTAUT model is quite new, it is quickly growing in popularity. Additionally its viability, validity and stability in technology adoption research studies within several contexts have already been confirmed, for example [25-28] studies in TRA, TPB, and TAM developed The UTAUT model informs understanding of factors which influence acceptance of an important new technology. Even though the UTAUT model is quite new, it is quickly growing in popularity. Additionally its viability, validity and stability in technology adoption research studies within several contexts have already been confirmed, for example [25-28] studies in TRA, TPB, and TAM developed substantial efforts in order to improve understanding of the area of IT adoption theories and they produced a significant basis for discussions and arguments. Nevertheless, difficulties remain amongst those theories. First, despite the fact that every model utilizes various terminologies within their phraseology of acceptance elements, they are basically similar aspects. Next, as a result of the nature of behaviour research and the limitations on the researchers, we lack an individual theory which addresses most (or a majority) of the factors. Basically, every theory and model has its own restrictions and does not enhance the other [29, 30]. Moreover, the UTAUT model explains 70% of technology acceptance behaviour intention whereas other models explain just over 40% of acceptance [13]. Therefore, the UTAUT includes more factors affecting the intention of the behaviour. It comes to fill the deficiencies of the other models and theories and combines them. Yet, UTAUT is the most all-encompassing IT adoption theory.

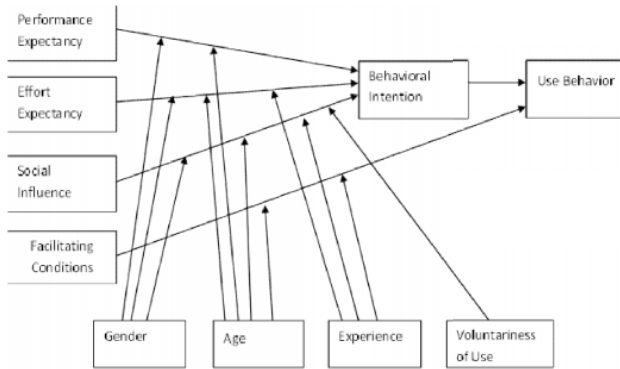


Fig. 1 UTAUT model[13]

### III. RESEARCH IN E-GOVERNMENT CITIZEN ACCEPTANCE

Carter and Belanger suggest that “e-government is the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and agencies” [31]. Providing e-Government services is meant to make it easier for consumers to access services from the comfort of their homes but various factors inhibit the growth and development of e-Government services as has been revealed through studies conducted by different researchers.

The e-Government model has three constituents – the government, businesses and the citizens [1]. E-government can hence be categorized into three different categories – Government-to-Citizens (G2C) Government-to-Government and Government-to-Business. The G2C initiatives have been designed with the intention of facilitating services like renewal of licenses, paying of taxes and applying for benefits. While the purpose is to make it easier for the citizens as well as the government, e-Government services have not been well accepted so far. While the benefits of e-Government are immense, the adoption rates are extremely low.

E-government implementation is severely impacted by security and private concerns, trust, authentication and computer literacy [31]. Citizens fear online financial transactions and hence would resist sharing personal information. Thus privacy and security concerns are inter-related and impact e-Government adoption. Using electronic intermediaries can reduce the risks and uncertainties in using e-Government services. This is particularly helpful in developing economies where citizens demonstrate trust in intermediaries such as post offices. The intermediary concept can be useful in penetrating in regions that have poor infrastructure to conduct e-services and in regions with a digital divide.

Coping with policy alienation, corruption, ineffectiveness and inefficiency may assist governments in restoring public trust in web-based public services [32]. On the other hand, the digital divide and the lack of access to e-services are challenges that impact participation and act as barriers to the take up of e-Government services. Age has been found to impact the use of technology as the younger generation is more likely to use such services. In Qatar the government launched free wireless internet access to encourage citizens to

start using e-Government services. The study found that ease of use, perceived usefulness and safety and security measures were the independent variables that impact on the individual’s intention to use the services.

Acceptance and use of e-Government services has been extensively studied in different environments. In India e-government initiatives were taken in Tamil Nadu but it was not a success because of *lack of government support, non-scaleable technology, and ownership problems*. In Saudi Arabia e-government initiatives failed due to lack of a legal framework to secure e-transactions [33].

Governments of several nations such as Bahrain, Oman, Philippines and Australia have been offering short-messaging service (SMS) based e-Government services to their citizens. However, a survey to determine what factors inhibit the acceptance of these services found most factors as have been included in the UTAUT model of technology adoption. According to Susanto and Goodwin, these include “*perceived ease of use; perceived efficiency in time and distance; perceived value for money; perceived usefulness; perceived responsiveness; perceived convenience; perceived relevance, quality and reliability of the information; trust in the SMS technology; perceived risk to user privacy; perceived reliability of the mobile network and the SMS-based system; trust in government and perceived quality of public services; perceived risk to money; perceived availability of device and infrastructure; perceived compatibility; and perceived self-efficacy in using SMS*” [34]. SMS is popular in all of these countries but the same technology has failed to engage people in using it for e-Government applications. Lack of Trust in the government and the perception that the services are poorly delivered are other strong reason for the rejection of e-Government services. Since traditional government services are poor, citizens do not have confidence that the government e-services would be delivered efficiently. The low accountability of the government is also responsible for dissuading citizens from adopting to these services.

Several other factors that deter consumers from adapting e-Government services include a poor website design and lack of functions available on government websites as has been found by Leigh and Atkinson [1]. The same authors cite that in Egypt the decision-making process has to be better comprehended and the related organizational problems have to be resolved. Besides, e-Government services are accessible from anywhere in the world which exposes the services to high external risks.

Alzahrani [35] cites several studies conducted by Carter and Belanger on consumers’ intention to use e-Government services. These studies were conducted on people that had been using the internet for over nine years and found that perceived ease of use does not necessarily enhance willingness to use and accept e-Government services. Using TAM and DOI the researchers also found that relative advantage and compatibility have a marked influence over the intention to use technology and e-Government services. Yet, results from findings can differ based on the size of the sample and also the period in which the study is conducted. This was the

contention of Carter and Belanger when they encountered different results between the pilot study and the main study. Again, the factors that are significant for a certain age group may not be the causal factor for another. For instance, image is significant for the younger generation but it is not the case with the older generation. Senior citizens in China give importance to PU which may not be applicable to the younger generation within the same culture. Even e-voting among the 18-24 year olds is influenced by trust in the internet and government agency. In Hong Kong family influence is significant in acceptance and use of e-Government services, thereby endorsing the influence of cultural background in acceptance of technology. Low stress and visual appeal are also significant factors influencing adoption of e-Government services. Awareness and previous experience is also important in adoption of these services.

To sum up, different researchers have adopted different models and frameworks to examine the adoption of e-Government services. Several models of technology adoption have been developed, these have been extended and modified from time to time. However, factors that govern technology adoption extend beyond the models. UTAUT is a model that encompasses the maximum number of factors that have been found to have significant influence over adoption of technology. These factors vary across regions, age, gender and culture and hence no particular model can be said to be perfect. This study may reveal further factors that have not been revealed hitherto and hence could add to the existing studies. This could necessitate formulation of another model or extension of an existing model.

#### IV. REVISED UTAUT FOR E-GOVERNMENT CITIZEN ACCEPTANCE

As UTAUT developers recommend [13] the modification and revision of the UTAUT model is required to suit the e-Government applications on one hand and the nature of Saudi citizens, on the other. The extended and revised model is shown in Fig 2.

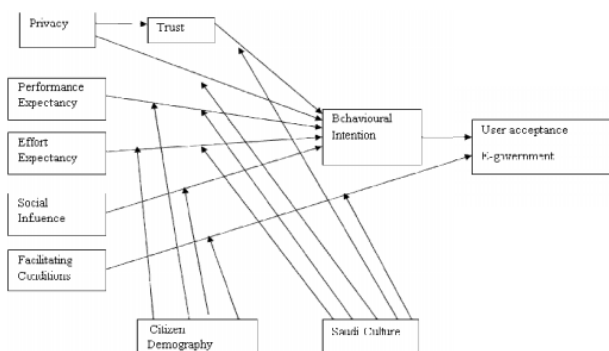


Fig 2 Research Model

#### A. Culture

Culture has been defined in various ways by various authors and researchers varying from universal to more precise in accordance with the context of use. It is one of the key factors with regard to technology adoption and plays a major role in influencing the manner in which it is accepted by individuals across various regions. The usage and success of any technology is greatly driven by the behavioural norms of any society since the citizens may tend to resist change thereby eventually leading to negative consequences with regard to technological implementation [36]. Societal factors which is a key indicator of culture, also heavily influences individuals who may or may not accept the new technology according to their respective beliefs and social customs [37].

With regard to Saudi's culture, in particular factors such as religion, the presence of tribes and the overall regime may have a significant impact on the attitudes of people towards modernization in general and technology adoption specifically. Historically Saudi Arabia has assumed a place of great significance and prestige in the Islamic world owing, in particular, to the presence of holy shrines [38]. This factor has played (and continues to play) a major role in influencing the attitudes of its citizens which are heavily influenced by religion. Religion is an inherent and inevitable part of Saudi culture, and acts as a major force in determining societal norms, traditions and practices [39]. Furthermore the tribal system which is also an inherent part of Saudi society also influences individual attitudes and perceptions towards modernization and hence may determine the success or failure of any given technology.

National culture is a critical factor which influences the manner in which the society or the nation functions [40]. Organizational culture can be seen as a direct reflection of the national and societal culture and norms, which in turn affect the use of technology; hence such factors need to be studied comprehensively prior to implementing e-Government. The usage patterns of internet in Saudi Arabia acts as a crucial study, which may help in understanding the acceptability of e-governance among the citizens. The advent of internet and its applicability in Saudi, in 1999, provides an example of the strong opposition of Saudi leaders, who considered certain 'objectionable' content freely accessible on the internet as something against their culture. However, finally with several deliberations and debates, and post the implementation of a robust filter system to filter such content, the internet was ultimately made available to the general public. Such instances indicate the strong influence that social and cultural factors have on adoption, implementation and acceptance of new technology.

In the research model, for research in e-Government citizen adoption in Saudi, Saudi culture will be considered as an important moderating factor in making the model more applicable to the Saudi context.

### *B. Privacy*

Privacy in general is not defined by one definition, which means that the definition and limits vary from one environment to another. However, the common feature in all these definitions is that privacy is one of the perspectives of human rights which are mainly dependent on the environment and context. We find that international law does not mention the definition given for privacy, but only establishes provisions to ensure protection of this right.

Westin[41] defines privacy as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others". Clarke [42] suggests privacy "is the interest that individuals have in sustaining a 'personal space', free from interference by other people and organizations."

No doubt there are exceptions to the right of privacy of the individual which are needed in the transparency of information to maintain national security. There is a lack of agreement about what these exceptions should be [43].

As a result of the dramatic increase in the spread of information technologies, there has also been a significant increase in services accessed through this technology, all of which may lead to a real risk to privacy. Privacy has grown in prominence in this era - the era of information technology - particularly in the operation of e-Government transactions and dealing with potentially millions of records of citizens and customers. These records include personal data and people's concerns, interests, and their activities. Along with the tremendous possibilities arising from the analysis of these data, which can be easily transferred between continents in a few seconds, comes a growing threat from increasing numbers of hackers and identity thieves. Consequently, privacy breaches have become more common. A lot of research centers conduct statistical research into identity theft and fraud; these statistics have recorded growing numbers over the past five years. One of these studies recorded about 8.1 million people in US exposed to identity theft in 2010 according to a report by Javelin Strategy & Research[44]. Mounting concern regarding the possible misuse of sensitive data, or indeed any use of the data in a manner not intended by the individual citizen, has ensured that privacy is an issue that has gained prominence in the public mind. In the Saudi Arabian e-Government context, the concerns and challenges surrounding the concept of privacy are noted and how these should be taken into account in the adoption of e-Government transactions is considered. In addition, the Saudi constitution has no provision for a right to privacy, but in 2007 the "IT Criminal Law" was introduced defining IT crimes and their prospective punishments. However, the IT Criminal Law, written in Arabic, does not define the privacy right nor does it mention any relevant punishments that might be applied to companies, organisations and website operators who do not protect the privacy of their customers/visitors.

### *C. Trust*

Studies of e-Government have consistently identified the citizen's trust as a prerequisite. Trust between the government and the citizen is inevitable for this technology to function effectively. Citizens interact with e-Government services through their computer or mobile devices. This interaction requires the sending and receiving of data and personal information and some of this sensitive information such as credit card details are required to complete transactions online. Previous studies have identified the absence of confidence and trust of citizens as one of the major obstacles to the adoption of e-Government [2, 45-49]. In Information Technology adoption theories, research has focused on the acceptance behaviour toward the technical system itself whereas in case of e-Government using or without using mobile channels, citizen acceptance requires not only an acceptance of the technology but also the acceptance of those providing the e-Government service. So in terms of trust there is trust of technology and also trust of e-Government services [2, 50].

Several definitions of trust have been found in the literature. One of these definitions is "the mutual confidence that no party to an exchange will exploit another's vulnerabilities an exchange partner is trustworthy when it is worthy of the trust of another" [51:176]

It is clear from this definition that trust is a vital aspect of any relationship between parties.

Moreover, trust is defined as a belief that others will behave in a predictable manner [49]. The citizen's trust of e-Government services can be perceived by the availability of three characteristics which are ability, benevolence, and integrity [52, 53]. Ability means "that group of skills, competencies and characteristics that enable a party to have influence within some specific domain" [53: 717]. Benevolence means "to want to do good to the trustor" [53: 718]. Integrity means "to a set of principles that the trustor finds acceptable" [53: 719].

In this research, the trustee is the government and the trustor is the citizen. People usually have concerns about privacy and misuse of their personal information when this information is shared over the electronic channel [2]. Therefore, in this research it is assumed that privacy and trust positively correlate. Whenever citizens feel the need to maintain the level of their privacy there is an effect on their trust in dealing with e-Government services.

### *D. Citizen Demography*

The UTAUT model uses four factors (Age, Gender, Voluntariness of Use and Experience) to moderate the relationship between affecting factors. Likewise, as this research will concern citizens making different levels of use of e-Government services and who have different attitudes and acceptance behaviours toward e-Government citizen demographics are an important factor in the study of citizens' acceptance to interact with e-Government services using or without using a mobile channel. A number of previous studies indicated the important factors, which include Gender, Age, Income, Education and Marital Status [54-56]. The current

research model combines these moderating factors into one single factor.

#### V.CONCLUSION

For studying citizen adoption of e-Government services in Saudi Arabia, an amended UTAUT model that integrates the factors of e-Government has been proposed. We recommended that trust and privacy should be included in the proposed model. The "experience" and "voluntariness" from UTAUT's moderating factors were proposed as being included in "citizen's demographics" while "Saudi culture" would be added to the list of moderating factors.

The next step after the conceptual framework has been established is to test the theory; the following have to be completed: Development of Hypothesis; designing research methods appropriate to the research hypothesis; development of a research instrument suitable for measuring the constructs of the research model and collection and analysis of data for model validation.

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