Examining the Influence of Intermediaries in Facilitating E-Government Adoption: An Empirical Investigation

Abstract

The adoption and diffusion of electronic government is often impeded by many social and individual factors relating to citizens. In this respect, intermediaries have emerged as a new model for delivering e-government services to overcome such obstacles. This study aims to examine the role of intermediaries in facilitating e-government adoption and diffusion using a survey based empirical study of 502 participants in Madinah City in Saudi Arabia. An extended UTAUT model is used as the theoretical basis utlising trust in the Internet and Intermediaries. The results of this study show that there are significant relationships among the factors that influence intention to use e-government, namely, performance expectancy, effort expectancy, and trust of intermediary. In addition, the findings show that there is a significant relationship between facilitating conditions and usage behaviour proving that intermediaries can influence adoption of e-government services.

KEYWORDS: e-government, adoption, UTAUT, Saudi Arabia, intermediaries.

1. Introduction

With the advancement of Internet based technologies, pressure on governments to e-enable their services have continued to intensify. In this regard many studies have been published with the aim of studying the adoption factors of e-government at a universal level. However, the adoption level differs from country to country for the reason that the demographic gap, education levels and the experiences of using technology (Internet). The diffusion and adoption of e-government services has been given much attention by a number of researchers (El-Haddadeh et al, 2013; Belanger and Carter, 2012; Lee at al., 2011; Bwalya

and Healy, 2010, Al-Shafi and Weerakkody, 2007; Heeks, 2005). For example, Heeks (2005) suggests that the rate of adoption and diffusion of e-government and the factors influencing adoption and diffusion varies between countries. Heeks (2005) also explains how e-government initiatives differ from developed countries like European nations, to middle-income countries like Latin America and East Asia, to those developing countries that make no progress or allow limited usage of ICT in an e-government context. Therefore, some citizens are bound to be excluded from benefiting from e-government, creating a huge gap and inequality of accessing e-government due to limited access to the Internet and exposure to associated ICTs (Margetts and Dunleavy, 2002). In this regard, many countries worldwide have established solutions and strategies to increase access to public services and effectively facilitate the usage of information technologies (Cabinet Office, 2005; Phang et al., 2005). One of these strategies involves using third party intermediary organisations to facilitate the adoption of e-government services by offering additional support to citizen (Bailey and Bakos, 1997; Sarker *et al.*, 1996). According to the literature, the concept of the intermediary is classified in different forms, ranging from Internet applications, such as PayPal, Amazon, and eBay, to physical organisations, such as estate agents, travel agents, and the Post Office (Janssen & Klievink, 2009; Bailey & Bakos, 1997). In the context of this paper, this study adopts the definition offered by Janssen & Klievink (2009), who defined an intermediary as ―any public or private organisation facilitating the coordination between public services providers and their users.

In the context of Saudi Arabia, e-government efforts have been largely focused on big cities like Riyadh, Mecca and Madinah. In-depth analysis of these cities illustrates that they have merely managed to implement basic e-government services, with emerging research studies accentuating various barriers to successful implementation and progress, which are linked to the government (or service providers) and the citizen (user aspects) (Abanumy et al., 2005;

Al-Fakhri et al., 2008; Al-Shehry et al., 2006). Despite a dramatic increase in the number of Internet users from about 200,000 in 2000 up to 6,380,000, a growth of about 3,090% (ibid), there are still delays in utilizing and adopting e-government services (Al-Sobhi at al., 2010; Hamner and Al-Qahtani, 2009). Nonetheless, in order to improve usage of the e-services offered by public administration and to minimize the difficulties that may hinder citizens from using e-government, the city of Madinah in Saudi Arabia has introduced 'intermediary organizations'. These organisations are operated by the private sector under Saudi government legislation and authorization, and are considered the most appropriate channel to mediate the relationships between government departments and citizens in a Saudi context. These offices are independent private organisations that offer a number of services to the general public and operate in each city in Saudi Arabia. They are used mainly to support access to public services and to collect the required fees. The offline channel is the private organisation that empowers citizens to access public services that are only available through telephone or face-to-face interactions. With the potential that e-government has on delivering public services to citizens through a non-physical intermediary (i.e. the Internet), the Madinah city government in Saudi Arabia has discovered that many benefits can still be gained from using existing public service offices to deliver e-services by using these as an intermediary to facilitate citizen adoption of online services provided by the government. The Saudi government believes that using physical intermediaries will help those citizens who are not computer savvy and those that have no access to computers to adopt e-government. This strategy takes the opposing view to the disintermediation approach (whereby intermediaries are removed from the relationship and direct contact is initiated (Chircu and Kauffman ,1999; Malone et al., 1987). Therefore, rather than the removal of government services through offline channels, the Madinah government has decided to re-establish them under their e-government service delivery strategy.

The rationale for undertaking this study is to explore what are the important factors that affect the adoption of e-government services in Saudi Arabia and what influence intermediaries have on adoption. In order to answer this question a research study is undertaken in Madinah city in Saudi Arabia. Madinah launched e-government services in 2003, and at present is considered to be the second most culturally important city in Saudi Arabia. The rationale for selecting Madinah for this research is that in terms of national progress, Madinah is the only city that has implemented the e-government intermediary (e-office) concept under their local e-government initiative. In addition, although intermediaries are used in some countries, including in Europe, Asia and the US in an e-government context, research into the impact of intermediaries in this context is rare. This research will therefore examine the role of intermediaries in e-government adoption using the services provided by the traffic department as one example of e-government in Saudi Arabia. Therefore, the respondents are only Saudi male citizens or expatriates as females are not allowed to drive in Saudi Arabia.

In order to meet the aim of this research, this paper first offers a brief overview of the theoretical background and the factors influencing the adoption of e-government services from the citizens' perspective. Next, a conceptual model and research hypotheses for evaluating e-government adoption in Saudi Arabia (Madinah) are introduced. In the following section, the authors describe the research methodology adopted to conduct the empirical data collection. Then the research findings are presented. Finally, the paper concludes by summarizing the key findings and outlining some recommendations for future research.

2. Theoretical background

As prior literature in the information systems (IS) and e-government realms show, few researchers have carried out studies that investigate the impact intermediaries on citizens' adoption and usage of e-government (Al-Sobhi et al., 2010; Janssen & Klievink, 2009). Most studies associated with e-government adoption have been mainly focused on the individual level factors that impact citizens' attitudes toward e-government (Reddick and Turner, 2012; Wang and Chen, 2012; Al-Shafi and Weerakkody, 2010; Carter and Belanger, 2005; Shareef et al., 2011). Further, studies have also highlighted the need to examine the adoption of e-services from the users' perspective, which are prompted by the roles of intermediaries (Bailey and Bakos, 1997; Howells, 2008). Hardly any studies have focused on understanding citizens' behaviour to examine the adoption factors when using intermediaries to access e-services (Al-Sobhi et al., 2010; Janssen and Klievink, 2009). Therefore, investigating the impact of intermediary organizations into e-government adoption has a research value and implications for policy makers and researchers.

Since many researchers in the information systems field build their argument on a theoretical background (Reddick and Turner, 2012; Al-Shafi and Weerakkody, 2010; Alawadhi and Morris, 2008; Carter and Weerakkody, 2008; Carter and Belanger, 2005), it is essential to present a theoretical model or framework that helps to understand the factors that affect the individual level (citizens) of adoption of e-government services prompted by intermediaries. Users' acceptance and adoption of technologies is considered as a primary condition to successful implementation and progress of any IT project, since users' attitudes to use and adopt new technologies are an important factor that may determine the success or failure of any information systems project (Pinto and Mantel, 1990; Succi and Walter, 1999;). According to Venkatesh et al. (2003: p. 446), users' acceptance of technology refers to the "initial decision made by the individual to interact with the technology". It has been found

that numerous theories and models could be used to examine users' adoption of information technology (IT). For example, technology acceptance models (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), the Motivational Model (MM), Diffusion of Innovation (DOI), the Model of PC Utilization (MPCU), Social Cognitive Theory (SCT), the model combined between TAM and TPB, and finally, the most recent model, the Unified Theory of acceptance and Use of Technology (UTAUT) could be used. The aim of the UTAUT model is to give a further complete explanation and prediction of users' behaviours that any older individual models could not have achieved alone. Each model mentioned above aimed to explain user behaviour and usage of new technology with a variety of independent variables; in fact, the UTAUT Model is proposed based on the similarities of these independent variables from each models cited above. According to the number of prior studies, the UTAUT model is the benchmark and most predictive model in the technology acceptance literature (Alawadhi and Morris, 2008; Al-Shafi & Weerakkody, 2010).

The UTAUT model contains different factors that either directly affects usage behaviour as facilitating conditions or, affect behavioural intention by other determinant factors like performance expectancy, effort expectancy, and social influence. Venkatesh et al. (2003) defined these factors as follows: facilitating conditions, which is "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453); behavioural intention, which is "the person's subjective probability that he or she will perform the behaviour in question" (Venkatesh et al., 2003, p. 288); performance expectancy, which is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447); effort expectancy, which is "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450); social influence, which is "the degree to which

an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). Also the UTAUT model considers moderator variables influencing the four direct determinant factors of behavioural intentions and usage behaviour such as gender, age, experience and voluntary use. However, since this paper is a result of a preliminary study of the factors influencing e-government adoption in Saudi Arabia and the role that intermediaries play in the adoption process, the adapted UTAUT research model in this study does not consider these moderators.

3. Conceptual model and research hypotheses of e-government adoption in Saudi Arabia

Since intermediaries assist users to adopt e-government, from a true sense, intermediaries create a facilitating environment for users to adopt e-government services. Under this paradigmatic similarity identified from a review of literature and theoretical background, we have used the UTAUT model as a framework to study the adoption of e-government facilitated by intermediaries in a Saudi context. While the research model used in this research was amended to suit the context of the study, the theoretical constructs included in the study are based on a review of literature. A model depicting the factors influencing e-government and intermediary roles in perceptions of enhancing intentions to e-government usage at the individual level (citizens) is presented in Figure 1. As such, the conceptual model proposed in this study uses the following factors from the UTAUT model: performance expectancy, effort expectancy, social influence, and behavioural intention toward e-government services.

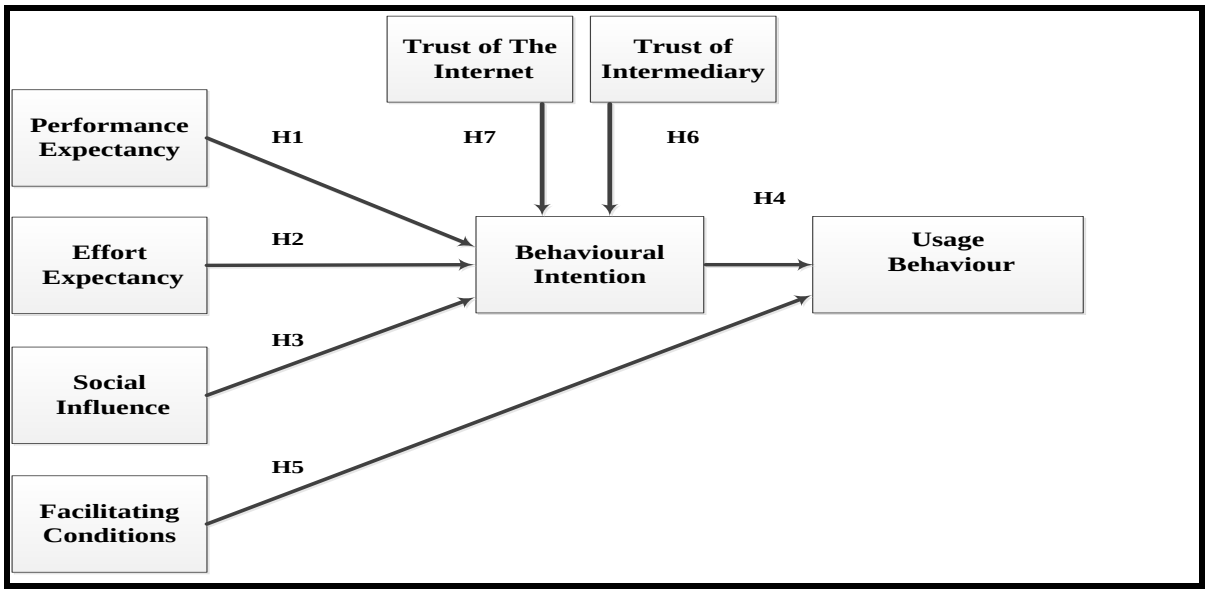

Figure 1 Citizen Adoption of E-Government through Intermediaries

A number of studies have applied UTAUT to explore citizens' acceptance of e-government in developed and developing countries, with many factors seen to be influential (Alawadhi and Morris, 2008; Al-Shafi and Weerakkody, 2010; Carter et al., 2008). In this respect it is significant to consider these factors when investigating citizens' intention to use e-government services through intermediaries in Saudi Arabia, which is a large developing country. In addition, it is necessary for this study to consider and incorporate additional factors into the UTAUT model that are specifically related to the Saudi Arabian context of using intermediaries to facilitate e-government adoption. As such, the model developed to study e-government systems in Saudi Arabia through the intermediary channel needs to be tested for its robustness and to offer a further explanation of the adoption of e-government services in the Saudi context. Therefore, it is essential to evaluate each construct in detail, so that the relevant measurement factors toward the attitudes of e-government services in Saudi Arabia are identified and justified.

3.1 E-government adoption constructs

Performance Expectancy (PE)

As explained before, performance expectancy is defined by Venkatesh et al. (2003) as a construct for UTAUT. In this research context, performance expectancy (PE) refers to the degree to which an individual believes that using e-government through intermediary (e-office) system will help him or her to attain gains in personal performance. This construct explains perceptions of usefulness, outcome expectations, benefits, and availability. Several prior studies have acknowledged that PE is a strong predictor of behavioural intention toward technologies (Alawadhi and Morris, 2008; Davis, 1989; Venkatesh et al., 2003). Further, e-government studies (Al-Shafi and Weerakkody, 2010; Shareef et al., 2011) identified precisely in the initial stage of e-government development that functional benefits of the system could pursue citizens to adopt the system. This study builds principally on the literature that has been published on studies of developing countries; however, it adds an 'intermediary organisation' factor, which may enhance the usefulness and accessibility of e-government for citizens (IT-Arabia, 2007; Janssen and Klievink, 2009). To determine the PE construct, this study measured citizens' perspectives regarding e-government services by benefits offered, reduced service time, saving money, effort required to contact government officials, and access to services around the clock. In order to market e-government services, governments should gain the benefits of intermediaries' overall functions (frequented by citizens) to distribute the e-government services. Therefore, the following hypothesis is proposed:

H1: Performance expectancy (PE) will have a positive influence on behaviour intention to use e-government services through intermediaries.

Effort Expectancy (EE)

In this research context, effort expectancy (EE) refers to the degree of ease associated with use of e-government services through intermediaries. Further, this study uses the three constructs from the UTAUT model: ease of use, complexity, and perceived ease-of-use. According to Venkatesh et al. (2003) there are similarities between these constructs in accordance with their definitions and measurement scales. Previous studies have reported that when users perceive a system is easy and effortless to use, they feel positive attitude toward acceptance of the system (Morris and Venkatesh, 2000; Venkatesh et al, 2003). Bandura's (1986) self-efficacy theory also supports this paradigm that users' control, skill, and experience of a system, which ultimately help them to achieve easiness to operate the system, enhance their motive to adopt the system. Consequently, the following hypothesis is proposed.

H2: Effort expectancy (EE) will have a positive influence on behaviour intention to use e-government services through intermediates.

Social Influence (SI)

In the current study, social influence (SI) is defined as the normative pressure of associated members like family or friends that influences the intentions to use e-government through intermediates. Normative pressure from society about intermediaries has impact on increasing awareness and forming social marketing to adopt e-government services. The relationship between SI and adoption has been widely investigated in the information systems field (Fulk and Boyd, 1991; Fulk et al., 1987; Venkatesh and Brown, 2001). Many scholars in information systems have proposed the impacts that SI represented by friends, family, colleagues and peers have on behaviour adoption at the individual level (Irani et al., 2009; Tan and Teo, 2000). Further, a study by Venkatesh and Brown (2001) found that SI of friends and families is a strong factor that affects adopting technologies. Marketing of online government services through intermediates therefore needs similar such signals (Maibach,

1993). For example, all intermediates like government offices, banks, school and others can be considered a hub for advertising socially about the e-government services and targeting individuals (citizens) in their location. In addition, because the intermediary is an important source of social support for new e-government services, the intermediary will work similarly as other media; for example, news and TV (Al-Shafi and Weerakkody, 2007) and help increase awareness of e-government services within society. Given this context, the following hypothesis is proposed.

H3: Social influence (SI) will have a positive influence on behaviour intention to use e-government through intermediates.

Behavioural Intention (BI)

This construct was found to have a direct influence on the individuals' (citizens) actual usage of any technology (Ajzen, 1991). In this study behavioural intention (BI) is defined as the degree to which citizens intend to use the Internet or an intermediary for e-government services in the future. This argument forms the premise for hypothesis number four.

H4: Behavioural intentions (BI) to use e-government services through intermediates will have a positive influence on e- government usage behaviour.

Facilitating Conditions (FC)

Many governments worldwide have proposed solutions in order to increase access to public services and effectively facilitate the usage of information technologies (Cabinet Office, 2005; Phang et al., 2005). Saudi Arabia has established a similar solution, "intermediary organisations" to minimise the difficulties that hinder citizens from using technology in general and e-government services in particular, which revolved around augmenting citizens' acceptance and usage of a new e-government gateway (Al-Sobhi et al., 2010). Citizens' empowerment was set-out by expanding the role and involvement of

intermediaries in e-society to meet the main goals of Saudi e-government initiatives. In this regard and according to UTAUT propositions, an intermediary can be proposed in this study under facilitating conditions (FC). In this study, a FC is defined as the degree to which citizens believe that organizational and technical infrastructure of intermediaries supports the use of e-government services and removes barriers to adoption. FC can be a determinant to citizens' intention towards using a technology or innovation.

Literature indicates that technology usage is always hindered by digital divide issues (Belanger and Carter, 2006; Carter and Weerakkody, 2008; Loges and Jung, 2001; Selwyn, 2004). For example, illiterate, unprivileged, and poor people are often classified as non-adopters of technology due to unfamiliarity and unavailability of the system for them; thus, any e-government strategy will need to consider how online services facilitate all citizens, so that they are not excluded from receiving the benefits offered by e-government (Phang et al., 2005; Selwyn, 2004). FC (intermediaries in the Saudi Arabia e-government context) would be more significant towards usage behaviour of e-government services. Consequently, the following hypothesis is proposed.

H5: Facilitating conditions (FC) will have a positive influence on e-government usage behaviour through intermediates.

Trust of the Internet (TI)

There are many studies that have highlighted the importance of trust in the adoption and acceptance of new technologies, and have assessed trust as an important factor that predicts user intention of e-services (Carter, and Belanger, 2005; Gefen et al., 2005; Pavlou and Fygenson, 2006). Once the interaction between parties takes place in a non-physical mode from a remote distance through a medium like the Internet, trust becomes an essential central

issue to be defined and measured. Trust plays a major role in creating the initial relationship between citizens and e-government, where citizens still do not know about e-service providers (Carter and Weerakkody, 2008). Rotter (1967) explains trust as an expectancy that the promise of an individual or group can be relied upon. Broadly, the literature shows that trust is classified into two parts: (1) Trust in the body (entity) that provides services (government bodies), and (2) Trust in the tools that will be used to deliver services to users (the Internet in this study). Teo et al. (2008) argued that trust in the body that provides an online service is a necessary condition. However, it is not only important to get users to use an 'e-services method', trust in the 'e-enabler' (Internet) is considered a significant, salient factor that predicts e-government adoption (Carter, 2008; Carter and Weerakkody, 2008; Gefen and Warkentin, 2002; Sang and Lee, 2009).

The aforementioned considerations have been hypothesised by many researchers in the e-government realm concerning building trust between 'government bodies' and 'requester' of services (citizens). Nowadays, Internet applications are popular in exchanging information and conducting transactions between government and its citizens. However, communicating with governments online through intermediaries depends on the level of trust in the Internet application, and this communication constantly deals with privacy and security, and risk issues. Accordingly, there are many risks when sharing information through the Internet, such as the risks of privacy and security (Carter and Belanger, 2005; Shareef et al., 2011). Privacy and security refers to citizens' trust in the electronic medium, where people usually have concerns about the security of the technology used for exchanging and storing their personal information, particularly when on-line financial transactions are involved (Carter and Weerakkody, 2008). E-government adoption, in turn, is dependent upon citizens' beliefs that the medium (Internet) used by the government to provide e-services is highly secure and

reliable to be used in providing private information (Teo et al., 2008). Thus, a high level of trust is likely to increase citizens' desire to use e-government (ibid). Also, it influences the take-up of e-government adoption. Further, developing trust between a government and its citizens is critical for the continued growth of e-government services. Citizens must trust the e-enabler (Internet) to keep their information secure and private in order to accept and adopt e-government initiatives (Carter and Belanger, 2005). Given these arguments, the authors propose,

H6: Trust of the Internet (TI) will have a positive influence on behavioural intentions to use e-government services through intermediates.

Trust of Intermediary (TOI)

Studies on the adoption of e-services through intermediaries are just beginning to emerge and are exploratory in nature (Al-Sobhi et al., 2010; Bailey and Bakos, 1997; Howells, 2008; Janssen and Klievink, 2009; Pavlou and Gefen, 2004). Several researchers who have studied intermediaries have shown how they can provide added value to service providers and requesters and increase trust between the two parties (Janssen and Klievink, 2009). For instance, according to Bailey and Bakos (1997) the central role of an intermediary is to enhance communication between parties by building trust and reducing risks in the electronic environment. Trust of intermediary (TOI) is defined as a "subjective belief with which a buyer believes that the intermediary will institute and enforce fair rules, procedures, and outcomes in its marketplace competently, reliably, and with integrity, and, if necessary, will provide recourse for buyers to deal with seller opportunistic behaviour" (Pavlou and Gefen, 2004, p.44). Given these insights, studying the role of intermediary could help better understand citizens' behaviour towards using e-services (Pavlou and Gefen, 2004) and possibly e-government (Al-Sobhi et al., 2010; Janssen and Klievink, 2009). Further, in the context of Madinah city, building trust in an intermediary will be considered as closely

relevant to e-government services adoption, since Madinah's citizens have to submit their personal information to the e-government portal through an authorised third party organization, which is the intermediary (e-office) (Al-Sobhi et al., 2010). Therefore, we propose,

H7: Trust of Intermediary (TOI) (e-offices) will have a positive influence on behavioural intentions to use e-government services through intermediates.

4. Research methodology

To assess the research model adapted for this study, a questionnaire survey was used. The questionnaire consisted of total 43 questions including demographic information. The questionnaire was built based on UTAUT model with revisions keeping the characteristics of e-government adoption through intermediaries (see appendix B). A pre-test was done using six researchers and three practitioners in order to improve the questions and enhance the comprehension of respondents before final distribution (Saunders et al., 2002). This pre-test resulted in minor amendment to the wording in seven questions. The proposed research model consists of six independent variables: performance expectancy (PE), effort expectance (EE), social influence (SI), facilitating conditions (FC), trust of Internet (TI), trust of intermediaries (TOI). These six independent variables are measured by 32 scale items in 5-point Likert scale, which ranged from strongly disagree to strongly agree as follows: PE by 7 items, EE by 6 items, SI by 5 items, TI by 4 items, TOI by 4 items, and FC by 6 items. Dependent variable intention behavior (BI) is measured by 3 items in Likert scale. As the questionnaire was designed in English and the targeted research context is an Arabic country (Saudi Arabia), the authors converted the questionnaire into Arabic and validated the translation by sending the questionnaire to four academic staff in a large Saudi university.

Because e-government is a relatively new concept in developing nations, the authors provided a brief explanation about e-government to participants through a cover letter attached with the questionnaire. To test the hypotheses through proper sample, the self-administered questionnaire was distributed randomly among 750 citizens in Madinah city of a broad diversity of citizens at several communities from September to December 2010. We segmented the city into four geographical regions named east, west, north, and south to keep our sample representative of Madinah city. From the Telephone White Pages of the city, we then collected addresses of those areas as well as houses, condominiums, and apartments located in those four regions. We also collected the addresses of the residents living in the suburban areas in the east, west, north, and south regions immediately outside the city. With the help of 10 voluntary students of a Saudi university, we distributed the questionnaires physically in all addresses with return mail postage. We personally met with the respondents and requested them to respond if they had personal experience of using the service (e-government services provided by the traffic department). We received total 626 responses, however, 124 were discarded because of incomplete answers (90 questionnaires), or because they were mistakenly completed by females (34 questionnaires). As stated before, since this survey was focused on the Saudi Traffic department as an example of e-government service, females were eliminated from the questionnaire survey since they do not have the right to drive in Saudi Arabia. Therefore, ultimately we used 502 responses for our statistical analysis which indicates effective response rate as around 67 percent.

5. Data analysis

We first attempted to verify the sample's representativeness by demographic analysis shown in Appendix A. From the distribution ratios of age, educational level, and computer and Internet experience of our sample, although, the sample is slightly biased in respect to

regular population, since ICT behavior and e-government usage is relatively new trend in a developing country like Saudi Arabia, obviously the interested respondents should be relatively young, educated and computer and Internet skilled. Therefore, it is logically acceptable.

Since identifying influence of intermediaries on adoption of e-government service is a new area and nature of the study is exploratory, we revised the questionnaire from the regular measuring items of the UTAUT model and thus, we conducted exploratory factor analysis (EFA). Those items which are loaded less than .40 or cross loaded more than one factor were removed (Stevens, 1996, pp. 389-390). Our EFA analysis retained all the six independent constructs as the pursuing factors of e-government service adoption offered through intermediaries. Among the 32 measuring items, the following items were removed: PE2 and PE5, EE3, EE4, and EE6, SI2, FC1 and FC2, and TOI1. The other measuring items were loaded according to the definitions of the respective constructs. Finally, we retained six constructs with 23 measuring items.

Cronbach's coefficient alpha values were chosen to examine the internal consistency of the collected data (Hinton et al., 2004). Hinton et al. (2004) suggest four different points of reliability: excellent (0.90 and above), high (0.70-0.90), high moderate (0.50-0.70) and low (0.50 and below). Reliability tests were conducted to measure the internal consistency on behavioural intention to adopt e-government services that is promoted by intermediaries' roles in the Saudi Arabian context. The reliability for each construct was ranged from 0.723 to 0.944 which indicates high to excellent reliability, and the model constructs are internally consistent.

Structural Equation Modeling (SEM) through Path Analysis

To identify the causal relations of the independent variables with the two dependent variables, we used path analysis through LISREL for structural equation modeling (SEM). As data input of path analysis, we took the average of the measuring items of each of the variables individually to get correlation matrix with the maximum likelihood procedure.

Our first model analysis failed to get accepted model fitness values and valid model. The model Chi-square, degree of freedom (df), probability (p), and root mean square error of approximation (RMSEA) are 39.87, df 7, p-value 0.00000, and 1.23 respectively which according to recommended specifications denotes unacceptable model fitness (see Table 1). Some constructs conceive overlapping concepts between them, so path analysis recommended adding error covariance terms between the constructs, FC and EE, PE and TOI, EE and TOI. Measuring unique variance between constructs, which reflect certain degree of overlapping concept, resulted in a better model; however, it is still poor. For parsimonious model, we then verified statistically significant variables which potentially contribute as the cause of behavioral intention and finally usage behavior of e-government service (here traffic department in Saudi Arabia) through intermediaries by 't' values of all the relations between dependent and independent constructs. Output from the path analysis indicated that PE, EE, and TOI constructs are significant factors for behavioral intention of e-government service which leads to usage behavior and FC being a direct significant factor for usage behavior through intermediaries at 0.05 level. However, TI and SI were found not significant, even at the 0.10 level. For model validity, we removed those non-significant relations from the model and ran it again, which provided acceptable model fitness for e-government adoption model through intermediaries as recommended by researchers (Hu and Bentler, 1999 and Kline, 2005, pp. 133-144). The accepted model revealed from path analysis of SEM with loading factors is shown in Figure 2. Chi-Square statistic, p-value, RMSEA, comparative fit index (CFI), goodness of fit index (GFI), and normed fit index (NFI) are listed in Table 1, with the

recommended values acknowledged by different scholarly studies, which prove the model validity. However, the $\chi 2$ statistic is 12.18 (df = 4), which indicates that the null hypothesis of the model is marginally not a good fit for the data. However, Chi-square is very sensitive to sample size. Larger samples, like our sample of 502 citizens, produce larger chi-squares that are more likely to be significant (Type I error). Therefore, it is difficult to get a non-significant chi-square when sample sizes are larger than 200 or so (Tanaka, 1993; Maruyama, 1998). The squared multiple correlation coefficient (R^2) is 0.43, which reflects the amount of variance the independent constructs explain in the dependent variable. This is a statistically significant contribution (Sig.= .000) and acceptable for this type of research.

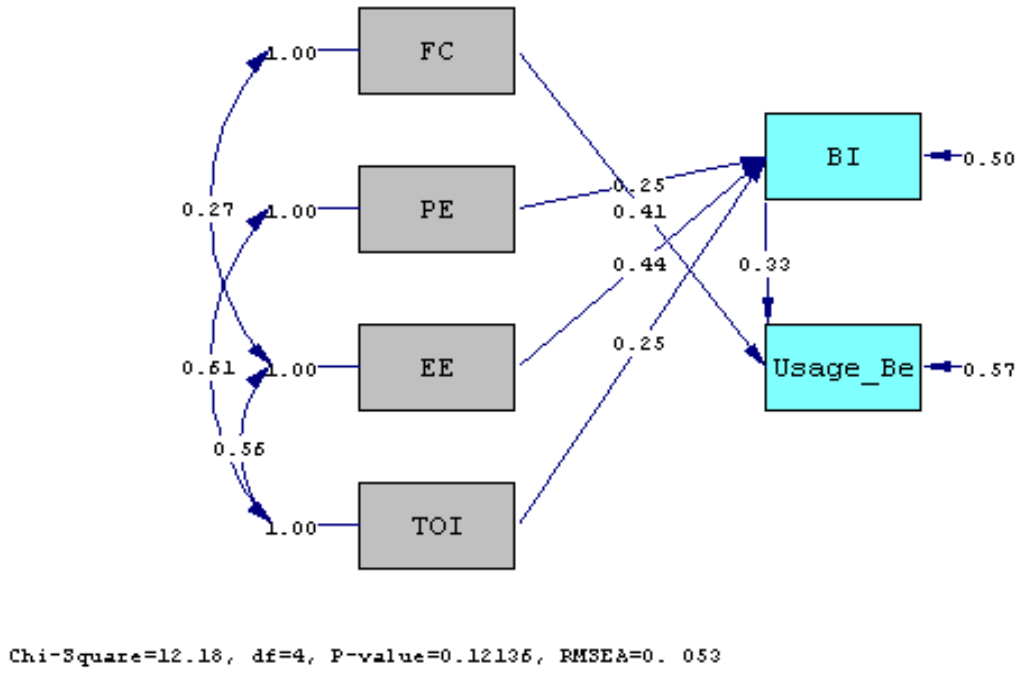

Figure 2 Citizen Adoption of E-Government through Intermediaries

Table 1: E-Government Model Fitness Values

Fit Measures	Recommended Values	E-Government Adoption Model
Chi-square ($\chi 2$)	$p \geq 0.05$	12.18

		(0.12136)
Degrees of Freedom		4
$\chi 2$/Degree of freedom (DF)	≤3.0	3.045
Comparative Fit Index (CFI)	≥.90	0.99
Goodness of Fit Index (GFI)	≥.90	0.98
RMSEA	<0.06	0.053
Normed Fit Index (NFI)	≥0.90	0.99

6. **Discussions**

From the path analysis we observed that PE, EE, and TOI have significant positive effect on the behavioral intention (BI) leading to usage behavior of e-government service through intermediaries. FC has also potential contribution in pursuing usage behavior of e-government service through intermediaries. However, SI and TI have no significant causal effect on BI to create usage behavior of e-government service through intermediaries. Therefore except the hypotheses H_3 and H_5, all other four hypotheses were found significant. EE, PE, and TOI are affecting usage behavior through BI whereas FC is affecting usage behavior directly for e-government service offered through intermediaries. The most important factor influencing usage behavior through the behavioral intention to adopt e-government services is EE. The second influential factor that impacts on the usage behavior of e-government service is FC. Then PE and TOI factors significantly contribute to the prediction of BI leading to usage behavior of Saudi Arabia's e-government service through intermediaries.

As reviewed in section 3, a strong association between PE and BI has been listed in literature (Carlsson et al 2006; Venkatesh et al., 2003) which is supported by our statistic

results. Previous studies have mentioned the importance of EE in explaining BI to use systems (Carlsson et al 2006; Venkatesh et al., 2003); this study found that there is a significant relationship between EE and BI towards e-government adoption. A significant relationship between SI and BI has also been reported in literature (Fulk and Boyd, 1991; Fulk et al., 1987; Venkatesh and Brown, 2001). SI, which is represented by friends and families are very important factors in influencing others (citizens) attitude towards adoption of new e-services. However, this study indicates that SI does not affect BI of e-government services significantly, which is a general contradiction to the UTAUT model. The reason is obvious. In this study we have defined the central concept of PE which is created by intermediaries. We have also measured FC developed by intermediaries. Therefore, for any e-government virtual service which is provided by brick and mortar organisations like intermediaries, general citizens are more concerned of its performance and auxiliary support rather than any imaginary image of e-government services. We also find strong correlation between PE and SI (0.819) and between FC and SI (0.756). Therefore, we can argue that both the constructs PE and FC have explained enough variance of SI on the usage behavior of e-government service through intermediaries; as a result SI has significant impact on BI. The result clearly indicates that when more FC are provided and more functional benefits are created by the intermediaries of Saudi e-government, more encouragement will be created for the citizens to adopt e-government services offered through intermediaries without any direct impact of SI. The current study was designed to determine the influence of TI on BI towards e-government adoption. According to prior studies (Belanger and Carter, 2008; Carter and Belanger, 2005) TI was found to have a positive impact on BI to use e-government. Attitude to use e-government services are influence by citizens' beliefs that internet is a safe place to communicate with government online, and this is related to the legal and technological structures in the country (Belanger and Carter, 2008; Warkentin et al., 2002). Therefore,

belief that the Internet is a robust and safe environment highly influences e-government adoption and usage (ibid). When citizens' trust increases, it leads to increase in e-government usage. However, this study included a new trust building component for e-government service which is hypothesized here as trust on intermediaries. The results of this study show that intermediary organisations, interacting directly with citizens through offline means, build trust between citizens and services provider (government) in Saudi Arabia's e-government context. In this respect, consistent with prior studies in e-commerce context (Bailey and Bakos, 1997; Howells, 2008) this study found that intermediary (e-office) is a very important gateway to build trust between government departments and citizens in services provided online. The possible explanations for this trust in the intermediary might be the citizens' lack of confidence and trust in the security features of Saudi Arabia's e-government systems. Since citizens are interacting with Saudi Arabia e-government services through Internet which is assisted by intermediary organizations through offline service, the two constructs TI and TOI uphold overlapping variance on behavioral intention. As a result, when TOI contributes significantly as the cause of BI leading to usage of e-government services offered through intermediaries, TI is not-significant as the cause of BI leading to usage of e-government services. Hence, enough variance of TI on BI is already explained by the construct TOI.

In the context of Saudi Arabia, the Madinah region has successfully introduced intermediaries to promote its e-government services. Intermediary offices (known as e-offices in Saudi Arabia) worked closely with local government to provide citizens the needed help and support in accessing e-government services. This included public services such as renewing driving licences and passport renewal applications. However, while the Madinah region in Saudi Arabia has established intermediaries under their local e-government strategy, other regions have yet to adapt the concept of intermediaries in Saudi Arabia. The e-government model presented in the study has thus opened a new avenue for citizens' adoption behavior of e-

governmnt in addition to the regular driving constructs of the UTAUT model by introducing the construct TOI. Given this context, the results of this study clearly demonstrate that intermediaries can be utilized as a bridging channel to engage citizens with e-government services at local level particularly in countries where uptake of services have been low.

7. Conclusion, research limitations and future directions

This finding suggests that the intermediary is a very useful channel gateway in improving trust and facilitating e-government adoption and diffusion. It also suggests that the Saudi government should further exploit the intermediary (e-offices) concept in order to enhance trust in their e-government services. Such positive attitude of citizens to communicate with government online through intermediary shows that e-government adoption could increase with the use of intermediaries. Moreover, as the literature has showed trust would be an issue in a non physical environment like the Internet, such uncertain situations may entice citizens toward using intermediaries as a gateway to adopting e-government services.

Further, the present study adds to our understanding of the role of intermediaries in working in parallel with different constructs to explain behavioral intentions to adopt e-government and confirms previous findings. Intermediary theory suggests that the most important roles of intermediaries are to enhance trust between two parties (Bailey & Bakos, 1997). This is confirmed by empirical findings in this study. Also, this study suggests that intermediaries are essential, particularly for developing countries as they develop their infrastructure to bridge any technical gaps and digital divide. The result also shows that there are considerable differences in measuring the use of e-government services from citizens' perspective either via direct online access or intermediaries. As a result, the introduction of intermediary organisations to raise awareness and assist citizens to use e-government services is an effective initiative by the Saudi Arabian government. The results of this study show that this

initiative can not only contribute towards building citizens' trust in online government services but also act as a driving force for the usage of e-government services.

Around the world, various initiatives have been established in the public sector to spread the usage and adoption of e-government services, including intermediaries. The aim of this study was to provide a better understanding of the role and influence of intermediaries in citizens' adoption of e-government services. Our findings suggest that factors such as Performance Expectancy (PE), Effort Expectancy (EE), Trust of the Internet (TOI), and Facilitating Conditions (FC) have an important role in explaining adoption behavior of e-government services offered through intermediaries. Thus, the study offered a new paradigm towards modeling factors that explain citizens' behavioural intention towards the adoption of e-government services offered through intermediaries. For senior management and policy makers, this study is considered of significance in providing the needed guidance in facilitating the diffusion of e-government services among citizens. In this respect, intermediaries will help in building and establishing trust between citizens and government agencies. Therefore, establishing trust in intermediaries positively influences the successful adoption of e-government services rather than accentuating trust on the Internet.

To the literature, this study is offering an integrated model that considered the role of intermediary in e-government adoption; this study is the first attempt to understand citizens' perspectives towards e-government adoption, through the intermediary channel. Thus, the above results offer many suggestions for e-government policy-makers. The most promising one is that government can diffuse e-government services to Saudi society by promoting the development of intermediaries as an important e-government gateway. By doing so, the strategy makers will make sure that e-government services are provided and accessible to all segments of society alike. Therefore, this study has made a novel contribution in examining the role of local government intermediary (e-offices) as a facilitator between the government

and citizens (and other stakeholders) in adopting e-government services. It also extends previous research by highlighting the most salient factors affecting adoption of e-government. Further, this study can serve as an initial point for future research in citizens' adoption of e-government offered through intermediaries in other countries. In particular, this study offers pointers to other developing as well as developed countries who may have issues with e-government adoption due to influencing factors such as trust in electronic services and the Internet.

Several limitations need to be considered when interpreting the results of this study. First, this study does not measure the moderator variables in UTAUT. Therefore, considering the moderator variables could further explains the main constructs that determine behavioral intention to use e-government services and usage behavior. Moreover, previous studies have highlighted gender as having a moderating affect on the main constructs presented in this study; therefore, considering gender issues (i.e. this study only considered males) would provide further explanation of the influence of intermediaries in e-government adoption. Also, future research could examine other demographic moderators such as age and internet experiences variables within the main constructs that are identified in this paper. Another limitation of this study is that this research is based on one city in Saudi Arabia, which has adopted the intermediary concept under their local e-government strategy. It could be noted that the results in this study may not be applicable to others cities in Saudi Arabia or even other countries that have similar economical, social and cultural situations. Therefore, any generalizations of the results should take into account the scope of this study. In this respect, future research could target other cities in Saudi Arabia to examine the willingness of public sector organisations to shift to intermediary e-offices and the resulting impact on e-government adoption and diffusion.

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Appendix A

Descriptive Statistics of Demographic Information

Variables	Category	Percentage
Level of Education	high school	51.6
	Undergraduate	39.6
	Postgraduate	8.8
Age in Years	18-30	50.8
	31-45	40.4
	45-54	6.95
	Below 18 or older than 54	1.9
Computer Experience in years	1-3	3.5
	3-6	13.75
	6-9	26.25
	10 yeras or above	53.95
	Never	2.55
Internet Usage Rate	Everyday	49
	Several days a week	26.4
	Several days a month	18.4
	Never	6.2

Appendix B

Survey Constructs and Definitions

Constructs	Definition	Item Code	Items
Performance Expectancy (Venkatesh et al ., 2003; Davis,1989; Davis et al.,1989; Moore and Benbasat,1991)	In this research, performance expectancy refers to the degree to which an individual believes that using the e-government or intermediary's (e-office) system will help him or her to attain gains in personal performance	PE1	Using the Traffic department website will enable me to renew my driving license more quickly
		PE2	If I use the Traffic department website I will enhance my social status
		PE3	Traffic department website would enable me to access Traffic department information and services when I need them – 24 hours/day, 7 days/week
		PE4	If I use the Traffic department website I will spend less time processing my driving license renewal application
		PE5	I think interacting with the Traffic department face to face would be preferable rather than interacting online
		PE6	I think interacting with the Traffic department through intermediaries (e-offices) would be preferable to interacting face to face with traffic department officials
		PE7	I think interacting with the Traffic department through intermediaries (e-offices) would be preferable to interacting directly with the traffic department website
Effort Expectancy (Venkatesh et al ., 2003; Davis et al.,1989)	In this research, effort expectancy refers to the degree of ease associated with use of e-government services	EE1	My interaction with the Traffic department website would be clear and understandable
		EE2	It would be easy for me to become skilful at using the Traffic department website
		EE3	Learning to interact with Traffic department website would be easy for me
		EE4	I find it easy to get the Traffic department website to do what I want it to do
		EE5	It would helpful to use intermediary (e-offices) to interact with Traffic department online
		EE6	It would be helpful to interact online directly with Traffic department
Trust of Intermediary	The degree which individual (citizens) believes that intermediary is a reliable tool to be used to obtain e-government services	TOI1	I think I can trust intermediary organisations.
		TOI2	In my opinion, intermediary organisations are trustworthy
		TOI3	The intermediaries (e-offices) have enough safeguards (passwords, secure computers etc.) to make me feel comfortable using it to interact with the Traffic department online
		TOI4	I am not concerned that the information I submit through the intermediaries (e-offices) could be misused
Use Behaviour (Venkatesh et al ., 2003; Davis et al.,1989)	The actual use and associated behaviour of the e-government services.	UB	Have you ever completed a transaction with the Traffic department online?
Social Influence (Venkatesh et al .,	In the current study, social influence is defined as the	SI1	People who influence my behaviour think I should use the online Traffic department services
		SI2	I would use the e-government services if my friends

2003; Ajzen, 1991; Davis et al.,1989; Fishbein and Ajzen, 1975)	important people pressure (family or friends) that influences the intentions to use e-government, and the influence of an intermediary in increasing the awareness and the social marketing to adopt e-government services		use them
		SI3	My Friends think intermediaries (e-offices) are helpful for using the Traffic department online service
		SI4	The intermediaries (e-offices) encourage the use of online Traffic department services
		SI5	People who are important to me think that I should use the Traffic department website facilities
Facilitating Conditions (Venkatesh et al ., 2003; Ajzen, 1991)	The degree which citizens believe that organisational (intermediary) and technical infrastructure support in using e-government services and remove barriers in such relationships	FC1	I have the computer devise necessary to use the Traffic department website
		FC2	I have access to the internet to use the Traffic department website
		FC3	I have the internet experience necessary to use the Traffic department website
		FC4	Given the resources, opportunities and knowledge it takes to use the Traffic department website, it would be easy for me to use the Traffic department website
		FC5	Guidance was available to me in the selection of the system
		FC6	A specific person (or group) is available for me in the intermediaries (e-offices) to provide assistance with Traffic department website difficulties
Trust In Internet (Carter and Belanger, 2005)	The degree which citizens believe that internet is reliable to be used in communicating with government online.	TI1	The internet has enough safeguards to make me feel comfortable interacting with the Traffic department website
		TI2	I feel assured that legal and technological structures adequately protect me from problems on the internet
		TI3	I feel secure sending sensitive information across the internet
		TI4	In general, the internet is now a robust and safe environment in which to transact with the Traffic department
Behavioural Intention (Venkatesh et al., 2003; Ajzen, 1991; Davis,1989)	In this study the behavioural intention is defined as the degree to which citizens intend to use the Internet or an intermediary for e-government services in the future.	BI1	I intend to use the Traffic website in future
		BI2	I intend to use the Traffic department website directly
		BI3	I intend to use the Traffic department website through intermediaries (e-offices) in the future