Older Adults in Households and e-Government services in Saudi Arabia, Hail City: A digital Divide Study of Adoption, Use and Diffusion.

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Abstract

The subjects of ICTs adoption and e-Government services have been widely investigated by researchers. It is an indication of the significant roles that can be brought to individuals and societies by ICTs and e-Government. Enhancing efficiency and effectiveness of governmental services being delivered to citizens (G2C) is the ultimate goal. However, many groups within societies are considered to be benefiting less from e-Government, as they are less receptive to ICTs. This has created a phenomenon known as digital divide. Amongst these groups are the older adults; therefore, this study attempts to detect and explain the challenges existing for elderly when using e-Government services in a developing country of the Middle East, in this case Saudi Arabia. The study uses a quantitative approach in which survey questionnaires will be distributed to households' residents (50 years old and above) in Hail city. The study will make a positive contribution to the existing literature on e-Government adoption, older adults and related body of knowledge. It will also produce relevant data that can be of assistance to Government policy makers and to the ICT industry.

Keywords: ICTs, e-Government, digital divide, older adults, developing countries, Saudi Arabia

1.0 BACKGROUND TO THE RESEARCH PROBLEM

The widespread use of Information and Communication Technologies (ICTs) is viewed as critical for economic growth and beneficial, not only for organizations and society alike, but for governments interaction with citizens. The provision of online government products and services is also generally known as e-Government (Carter & Belanger, 2003). When considering e-government, there are various types of it, which include: G2G (government to government), G2B (government to business), G2E (government to employees), or G2C (government to citizens). E-Government is also viewed to be essential for the development of a country, which has led to the concept of Information and Communication Technologies (ICTs) for development (ICT4D) (The World Bank, 2013; Njihia & Merali, 2013). Within the field of Information Systems (IS), the term Information and Communication Technology for development ICT4D has arisen as an expansion where emphasis is on the association between ICTs and development. Ever since the advancements of ICTs, ICTs are viewed to be means of reducing or eliminating poverty, which could lead to development.

Since ICTs are viewed as important for countries development and economic growth, governments around the globe are implementing, or attempting to implement a telecommunications infrastructure so that a proliferation of ICTs can occur (Helbig et al, 2005). However, these changes have led to certain groups of society accepting and using the new ICTs, which has led to differences within individuals and nations, which is causing an uneven distribution of novel technologies that is known as a digital divide (Antonelli, 2003).

A group of society within countries that is currently not accepting and using e-Government is the older adults (Niehaves & Plattfaut, 2014). According to the World Health Organization (WHO) (2015), the definition of older adults differs within countries, with developed countries viewing older adults as individuals who receive pension aids, whereas in the developing world this definition is not necessarily realistic. Therefore, in Africa for instance, the WHO suggests that the older adult concept should relate to people who are aged either 50 or 55 and above. Using this definition, it is declared at this point that for the purposes of this research, older adults are identified as individuals in the age ranges of 50 years old and above (Hanson, 2009). To further describe the term 'older adults' the definition being used by this study is 'an adult, generally 50 years of age or older, who continually spends time online and surfs the Web and are also known as silver surfers ("silver" refers to the colour of their hair) (Netlingo, 2013). The importance of older people is derived from the contributions they can offer to society. Older adults are known for their accumulative knowledge and skills gained throughout life experience, contribution to the economy in terms of employment, entrepreneurship and holding large amounts of wealth in society. By combining these factors and capabilities of the elderly there is a clear indication of the potential that older adults have in terms of promoting communities, improving and building community capacity (ActiveAge, 2010).

When considering e-government, older adults and ICT research, it has been found that there is little to minimal literature on this topic. Further, when ascertaining whether these topics had been considered in Saudi Arabia, it was even less, which suggested the existence of a research gap. This gap has motivated the research team to form the aim: *To identify, explain and understand the adoption and use of e-Government services within the older adults of vicinity in Saudi Arabia.* To ensure that an in-depth prospective can be obtained, this research will be focused on the research site of Hail city in Saudi Arabia. The contribution of this research for academia includes developing theoretical research identification and understanding. This will be in terms of older adults, ICTs and e-government research in Saudi Arabia and the Gulf region. For policy makers, the research identifies the eminent role of government authorities in bridging the gap between the older adults (users) and the ICT service providers (companies). For industry, the contribution is more for the Internet service providers. This paper assists by highlighting and identifying the issues older adults in Hail city face when seeking online products and services. To inform readers, the next section presents a brief literature review, along with the development of the hypothesis and the conceptual framework of this research. This is followed by a proposed research methodology, limitations and future directions.

2.0 Literature Review

In terms of the aim of this research, a critical question to be asked in academic research is whether e-Government is diffusing its services to stakeholders and whether the services have been adopted or not (Al-Sobhi, 2011). Research has found that e-Government is an effective and beneficial tool for the public sector. It delivers healthcare services, reduces cost, minimizes risk factors, and promotes the use of new ICT (Akesson et al, 2008). However, research has also found that if citizens are excluded from the benefits of ICTs, they lose the opportunities that ICTs can offer to societies (Selwyn, 2004). Prior studies indicate that the use of ICTs in government has flow-on effects on other sectors, which improves productivity and reduces poverty (Walsham & Sahay, 2006).

E-Government is an important area for developing countries where successful e-Government can lead to increased compliance with international codes, norms, and standards, which means higher levels of accountability and reduced corruption (Gregor et al, 2014). Successful e-Government can also play critical positive roles in important areas such as, health and security. However, 35% of e-Government initiatives in developing countries are considered to be failures (e-Government was not fulfilled or was fulfilled but immediately abandoned), and 50% were partial failures (major objectives were not accomplished or there were adverse results) (Heeks, 2003). Therefore, technology adoption is an important issue for developing countries growth and productivity (Gregor et al, 2014).

When considering the issue of e-government development in Arab countries, a few studies are evident; hence knowledge of present e-Government development initiatives would be beneficial. Within the Arab countries and e-government research, UAE, Bahrain and Qatar are Arab e-government leaders because they all offer public advanced e-Government services. Yemen, Iraq, and Sudan are lacking in all forms of E-government. It was also noticed that Saudi Arabia, Kuwait and Lebanon offer a wide variety of e-Government services (Alhujran, 2009).

2.1 Challenges and Barriers to e-Government Services Adoption

Academic research has identified various factors that may create hurdles and reduce the level of e-government diffusion and adoption in different countries. Some of these factors include availability and accessibility, which is also known as the digital divide (Al-Sobhi, 2011; Jaeger & Thompson, 2003; Brown and Thompson, 2011); usability (Criado & Ramilo, 2003); risk (Phippen, 2007), and trust (Carter and Belanger, 2005). Within these factors, accessibility and computer literacy have greatly contributed in creating a digital divide within countries and among individuals.

2.2 Digital Divide and ICT adoption of Older Adults

In digital divide research studies, age has been identified as an important factor for understanding the digital divide within societies (Heart & Kalderon, 2013). As mentioned earlier, there are disparities between groups of countries in terms of ICT accessibility and use. What is also evident is that in some countries of The Middle East there is acceleration in the elderly population due to increased life expectancy and declined fertility rates. For example, in Saudi Arabia life expectancy is predicted to currently reach the age of 75 and will reach 80 years old by 2050. Older adults are presently expected to form approximately 13% of the total population of the country. Additionally, within the smaller Gulf countries such as, Bahrain, Kuwait and the United Arab Emirates, fertility rates have declined over the past 40 years; hence the countries face an older adult population as well. (Stanford Center Longevity, 2009).

In addition to age, older adults adoption of ICT is also influenced by many other factors including, ICT illiteracy, education level and degree of ICT necessity (Neves & Amaro, 2012). Furthermore, Niehaves & Plattfaut (2014) explored the elderly intention to utilizing Internet and detected principal influencing aspects. Socio-demographic variables such as, income, education, gender, and age have been identified as barriers to ICT adoption in a developed country where the variables were found to be of great significance with regard to technology acceptance research (ibid).

2.3 ICT, e-Gov and Older Adults in the Middle East

Focusing on the commonly ignored aspect of e-Government services implementation quality, Alanezi et al. (2012) argued that the quality of services in governmental websites is a key element for

adoption and acceptance of ICTs among general public. The study has explored many quality aspects of the offered online services, such as the degree of information comprehension, ease of navigation, transparency, system availability, personalization, processing time, interactivity, credibility, security, and privacy. The study found that e-Government websites in Saudi Arabia need careful considerations regarding their service quality. Further, the study found that citizens would consider e-Government services as quality services only when these services meet their needs.

Another study was completed in Israel to determine ICT adoption by the elderly in order to assess their willingness to use health-related ICT. Findings indicated a limited adoption of ICT by the elderly, and that many of them do not agree with the opinion that their life quality can be considerably enhanced by ICT. However, it was found that perceived usefulness is a major encouraging factor for older adults to adopt ICT (Heart & Kalderon, 2013). Further, a research study took place in Oman, a Gulf state, where it was found that non-technical hurdles performed key role in using ICTs in e-Government services. These non-technical factors include lack of marketing campaign as well as less knowledgeable users regarding usage of ICTs. The aforementioned non-technical factors have negatively impacted the citizens' decision to adopt technology for e-Government initiatives (Alshihi ,2006).

AlAwadhi & Morris (2008) research in Kuwait investigated aspects that have an impact on the adoption of e-government services. The determined aspects were social and cultural influences, perceived usefulness, ease of use, trust in the Internet and other factors related to gender, technical and awareness issues. Another study of Saudi Arabia conducted to determine the factors and challenges facing the adoption of e-Government services among Saudi citizens found that many factors influenced e-Government adoption including, information security, compatibility, complexity, availability and culture. It has also emphasized the importance of some socio-demographic factors such as, age, gender, and education (Alateyah et al. 2013).

3.0 Development of the Conceptual Model and Hypothesis

Learning theories of attitude change attempt to clarify the mechanisms of how attitudes are being shaped by an individual (Lorge, 1936; Hovland et al, 1953). Many behavioural and pioneering researches, such as the theory of reasoned action (TRA) have adopted these learning theories as the principal theoretical model for their work (Fishbein & Ajzen, 1975). Learning theories takes into consideration three major aspects of attitude formation, which are social learning (equivalent to social influence in UTAUT & subjective norms in TAM), classical conditioning, and operant conditioning (Feist & Rosenberg, 2010). In this study, classical conditioning has been excluded as it relates more to one's extroversion and sociability, and does not serve the main purpose of the study.

Additionally, a trust model utilized previously by Bélanger and Carter (2008) is also adopted by this research where trust refers to one's confidence that the promise of others whether made by individuals or groups are reliable (Rotter, 1971). The Theory of reasoned action (TRA) is utilized as a guiding framework of the trust model. TRA suggests that beliefs have impacts on intentions, which in turn have impacts on individual's actions (Ajzen & Fishbein, 1972). Furthermore, Trust model applied in this study is composed of four constructs, which are disposition to trust, trust of the Internet, trust of the government, and perceived risk. An additional theory adopted by this study is the Diffusion of Innovation (DOI) theory of Rogers (1995). This theory is intended to justify and explore user acceptance of new technologies (innovations) in which these technologies are considered to be new. Diffusion is 'the process by which an innovation is communicated through certain channels over time among the members of a social society' (Rogers, 1995). DOI suggests that an innovation is influenced by five major constructs, which are relative advantage, complexity, compatibility, trialability and observability. In the proposed study, only relative advantage, complexity, and compatibility are included in the model whereas trialability and observability are excluded as they are considered to be of less relevance to adoption studies (Tornatzky & Klein, 1982).

Furthermore, image, visibility and voluntariness are factors that assist in the attempt to understand the influential factors of an innovation adoption and use (Moore & Benbasat, 1991). This extended model is named perceived characteristics of innovating (PCI). Out of the three aforementioned additional factors, image only will be included as it serves the purpose of the current

study. Having provided a theoretical background of this research study, the next subsections present the constructs and hypothesis of this research.

3.1 Social influence

In the context of this research, social influence refers to the impact a reference group has on an individual's behaviour. This group comprises individuals whose viewpoints are considered to be of immenseness importance. The reference group includes family members, partners, friends and colleagues (Venkatesh & Morris, 2000a). When considering the influences, the psychological desires and necessities of an individual are considered, which consequently leads to an attitude change by that individual to meet the expectations of his/her reference group (Deutsch & Gerard, 1955). Therefore, it is proposed that:

H1: Social influence will positively relate to older adults' intention to use MOI e-Portal.

3.2 Perceived cyber risk

Perceived cyber risk relates to an individual's reluctance and/or hesitations to use an online system due to the likelihood of being a victim of cybercrimes (Wang et al, 2009). In addition, like any other service or product delivered online, The MOI e-Portal is subject to be hacked and exposed to different types of cybercrimes. Therefore, how an individual perceives possible cyber risks might have an unfavourable influence on his/her attitude toward using an online system, and in this case, The MOI e-Portal. Hence, it is proposed that:

H2: Perceived cyber risk will negatively relate to older adults' intention towards using The MOI e-Portal.

3.3 Perceived Website assistance

Perceived website assistance is the perception that a website facilitates a user's activities and provide suitable support when needed (Chen & Sharma, 2015). In the context of this research, when a user recognizes that the MOI e-Portal offers him or her robust online assistance when managing personal online activities and overcoming any issue that might come up, the user is most likely to show a positive attitude toward the site. Therefore, it is proposed that:

H3: Perceived website assistance will positively relate to older adults' intention toward using The MOI e-Portal.

3.4 Compatibility

Compatibility refers to 'the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters' (Rogers, 1995). In addition, it has frequently been discovered in different contexts, such as, e-commerce that compatibility has indeed the most significant relationship with use intentions (Van Slyke *et al*., 2004). Therefore, it is proposed that:

H4: Greater levels of perceived compatibility will positively relate to older adults' intention to use The MOI e-Portal.

3.5 Relative Advantage (RA)

Relative advantage is 'the degree to which an innovation is seen as being superior to its predecessor'. In other words, the perception that an individual develops, in which he or she can conduct a task more easily by adapting the new innovation is relative advantage (Rogers, 1995). For this research, when considering RA, the MOI e-Portal should be more beneficial than the previous technology, product or service. Hence, it is proposed that:

H5: Greater levels of perceived relative advantage will positively relate to older adults' intention to use The MOI e-Portal.

3.6 Image

Some individuals consider using certain innovations to be an indication of having a high profile or status in society. That is, if someone had X, and at the time, X is considered to be an item associated

with social or economic status, then in terms of the MOI e-Portal, those using the e-Portal are viewed to be individuals with greater economic or social status. Moore & Benbasat (1991) propose that image refers to 'one's perceptions of an innovation as a status symbol'. Given the growing importance of e-Government services in Saudi Arabia as well as the great deal of coverage by the press, Image is being included. For this, it is proposed that:

H6: Greater levels of perceived image will positively relate to older adults' intention to use The MOI e-Portal.

3.7   Complexity

Complexity is 'the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand' (Rogers, 1995). As e-government services are relatively novel in Saudi Arabia in comparison to other developed and developing countries, the issue of complexity is probably one of the most significant aspects that influences the adoption of this innovation. It also becomes more influential when the users are older adults. Therefore, it is proposed that:

H7: Greater levels of perceived complexity will negatively relate older adults' intention to use The MOI e-Portal.

3.8   Perceived risk

Perceived risk is defined as "the citizen's subjective expectation of suffering a loss in pursuit of a desired outcome" (Warkentin et al, 2002). Perceived risk revolves around two main dimensions, which are the uncertainty of the environmental and the behavioural aspects. The environmental aspect is affiliated with the unreliable nature of the online world where control is not in the hands of the users. Behavioural uncertainty is derived from the fact that the providers of the web-based/online services have the ability to misuse or exploit the unofficial nature of the online world activities. Further, it has been statistically shown that user's intentions to perform online transactions and to reveal information can be reduced by the perceived risk (Pavlou, 2003). Whereas in perceived cyber risk, risk is all in terms of an online environment, and can include issues such as, online hacking, perceived risk can extend to the real world to include, how, for instance, internet service providers are imposing large subscription fee amounts upon consumers of an internet service. Therefore, it is proposed that:

H8: Perceived risk will negatively relate to older adults' intention to use The MOI e-Portal.

p.s. the items of this construct are broader and more general than the items of Perceived Cyber Risk (PCR). This construct is designed to obtain an idea of how older adults view online risks in general whereas PCR is more focused on specific online risks associated with utilizing MOI e-Portal.

3.9   Trust of the Internet (TOI)

Trust of the Internet (TOI) refers to 'an individual's perceptions of the institutional environment, including the structures and regulations that make an environment feel safe' (McKnight et al, 2002). In IS literature, TOI is usually termed as institution-based trust. Similarly, in e-Government research, it is critical that users (citizens) trust the mediator channel for carrying out online activities with the government in terms of information and transactions security (Shapiro, 1987). Therefore, users must trust the Internet to be a safe and trustworthy environment. Furthermore, as this construct influences both the perceived risk as well as the intention to use e-Government services (MOI e-Services), it is proposed that:

H9: A Higher trust of the Internet (TOI) will reduce older adults' perceived risk of using The MOI e-Portal.

H10: Trust of the Internet (TOI) will positively relate to older adults' intention to use The MOI e-Portal.

3.10   Trust of the government (TOG)

Trust of the government (TOG) refers to 'one's perceptions regarding the integrity and ability of the agency providing the service (McKnight et al., 2002). Users (citizens) of the online government services must believe that a given agency is capable of introducing secure, robust and trustworthy online services. Governmental agencies ought to prove for the users their ability to competently carry

out online transaction systems, in which all technical requirements and sufficient security measurements are being met. Otherwise, users will lose trust in governmental agencies, and subsequently lose the willingness to participate in any e-Government projects (Bélanger & Carter, 2008). Similar to TOI, trust of the government influences both the perceived risk as well as the intention to use e-Government services (MOI e-Services). Thus, it is proposed that:

H11: Higher trust of the government (TOG) will reduce older adults' perceived risk of using The MOI e-Portal.

H12: Trust of the government (TOG) will positively relate to older adults' intention to use The MOI e-Portal.

3.11 Disposition to trust

Disposition to trust is whether an individual tends to have faith and trust in others, which is without any immediate external influential factor. The trusting stance and having faith in humanity are two comprising dimensions of disposition to trust. The first means that an individual's view of others is positive as individuals are viewed to be trustworthy and dependable. The latter dimension reveals one's belief of acquiring better results when dealing with others since they are perceived to be good-natured and faithful (McKnight et al., 2002). Therefore, disposition to trust as it has been described is beyond the direct control of any government body. An individual disposition to trust affects his/ her trust of the Internet and trust of the government (Bélanger & Carter, 2008). Hence, it is proposed that:

H13: Disposition to trust will positively relate to older adults' trust of the Internet (TOI).

H14: Disposition to trust will positively relate to older adults' trust of the government (TOG).

Having described the hypothesis of this research, the next section now provides a description of the proposed research approach.
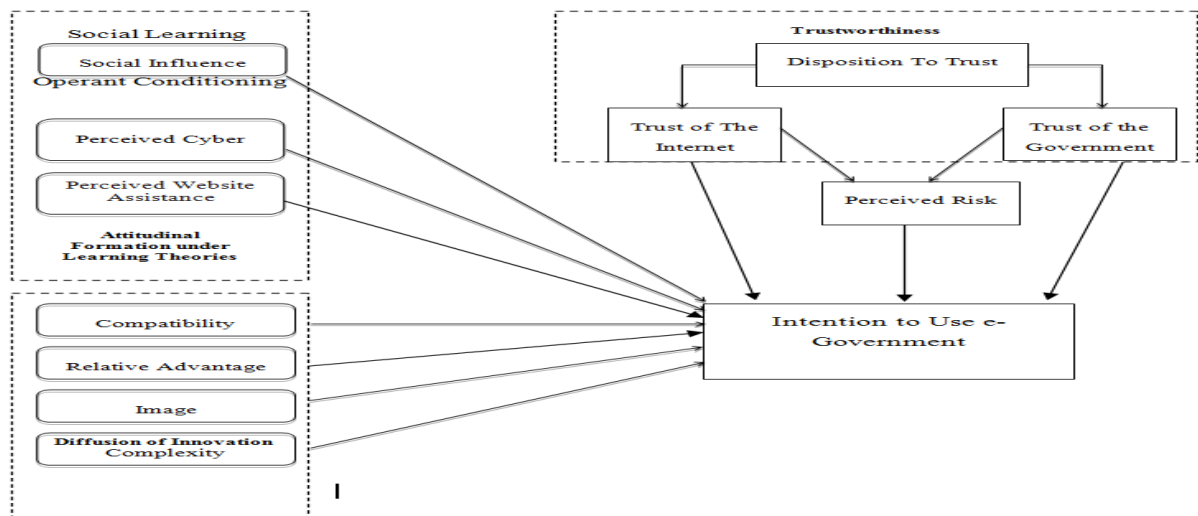
"Figure 1: The Research Conceptual Framework"

4.0 Proposed Research Approach

For this research ontology, a structured, rigid impression of the world is perceived, which implies that positivism is best suited to this study. This means a scientific approach involving identifying factors and testing them is best suited to study this problem. For this, a quantitative approach involving developing and distributing survey questionnaires will be the preferred data collection method. The questionnaire will be posted online and consist of approximately 40 close-ended, 7 Likert scale questions. Content validity results have already been received from the 10 experts panel that have identified any phrasing, relevance or language issues. The questionnaire will also be translated from English to Arabic for all the users.

A pilot study will also be used in this research to test the adopted constructs, which will also assist with construct validity. When determining a pilot sample size, some issues of consideration included, the purpose of the pilot, size of the final study sample, survey design, resources and time (Saunders et al. 2009). However, responses between 100 and 200 are considered to be sufficient for a pilot study that intends to undertake a comprehensive item analysis (Johanson & Brooks, 2010). Therefore, approximately 500 questionnaires will be distributed, of which about 200 completed replies are anticipated. For the final phase, about 1500 hard copy questionnaires will be distributed within expectation that over 1000 completed replies will be received.

To obtain the sampling population, a combination of a non-random sample methods involving stratified, self-selection and snowball sampling will be used. It is recognised that this approach does not offer generalisations of the country, but by pursuing this research study, an impression of the factors that can encourage the adoption, use and diffusion of e-government in Hail City, a large city of Saudi Arabia can commence. To ensure successful participants recruitment, a self-selection snowball approach with already established contacts will be sought and after speaking with them, more participants will be sought. For the stratified sampling approach, information on the population of Hail city will initially be sought. Then, households will be identified and an impression of the numbers in each household will be determined. Thereafter, the researcher and a female assistant will knock at residents' houses, distribute flyers to households' residents in Hail and finally, speak with colleagues at work, friends and family about the research and seek more participants. As a self-selection, non-random approach is being used, the research is mindful that when analysing the results, issues such as, external and internal validity will be examined and noted.

To ensure that all the participants will be able to provide a reply, the researcher will have hard copies of the online questionnaire and will also have a tablet device (i-pad) to provide online access. As the study will take place in Saudi Arabia, a division between genders is an impending challenge that will be dealt with by having a female assistant accompany the principal, male researcher when visiting participants at their houses and/or meeting them at public facilities. This is important for the sake of adherence to cultural and traditional norms of the Saudi society, especially when dealing with female participants.

The research site for this study is Hail City. The following explanation is provided for its use. Hail City is located at the heart of the northern region of Saudi Arabia, and considered to be the capital of the north. It links all the other northern cities with the capital city (Riyadh), the holy city of Mecca, and the southern regions of the country. It is anticipated that by the year 2016, the population of Hail city is going to reach an estimated 700,000, and as of 2007, about 13% of the total population constituted an older adults population (50 years old and above) (Saudi Central Department for Statistics & Information, 2010). This provided further support that a developed and advancing city such as Hail with an older adult population would serve as a good vicinity to conduct this research. Further, Hail has an academic institution that one of the researchers is an academic at, which encouraged the researcher to undertake this research study. Hail city is a popular destination for tourists as it is famous for its historical sites and desert sports (International Rally). Additionally, a considerable percentage of Saudi Arabia's agricultural production is from Hail Province. The city has a regional airport that offers flights to some surrounding Arab countries, and the government is intending to build a new international airport in the city. Further, to emphasize the importance of Hail city, in 2011, the former King launched a huge project leading to the development of Hail Industrial city. All of the abovementioned characteristics of Hail city, which highlights its importance in Saudi Arabia, as well as the principal researcher having established contacts and access to the city offered suitable reasons for selecting it as the research site of this study.

5.0   Conclusions, Limitations and Future Directions

This research has proposed the use of a research site, Hail City to address the aim of this research, which is to identify, explain and understand the adoption and use of e-Government services within the older adults of a vicinity in Saudi Arabia. This paper also explained the adoption challenges that exist for e-government, which included the concept of the digital divide. It was also highlighted that as other countries of the globe, Saudi Arabia is facing an increasing older adult population due to

increasing life expectancy and improved quality of care. Thereafter, the paper identified the theories and factors that would be utilised to develop a conceptual framework and hypothesis. Finally, a research approach was also explained. It is recognised at this point that a limitation of this research is that the sample population being utilised for this research is not a representation of the entire population, but by examining the sample of population in Hail City, an understanding of some of the issues impacting older adults will emerge. Therefore, for instance, if it is learnt that older adults trust the portal more than the government, this can provide further impetus for such research to be completed in the context of other larger cities of Saudi Arabia; for example, in Riyadh. Further, it is recognised that by pursuing an older adults population study the opinions and factors affecting younger people may not be addressed. It is envisaged that a future study consisting of a younger and adult population adopting, using and diffusing the MOI e-portal will overcome such a research gap.

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