Universalising Electronic Government Services: Facing the Digital

Divide Challenge

Khulud Alsufayri

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Abstract

Many governments have made considerable efforts to develop and offer e-government services. It has been argued that e-government services have been made available in many countries, but unequal access and ineffective usage are major obstacles for the realisation of e-government benefits. Inequality includes, but is not limited to, a low-level of education, limited access to quality ICT, a lack of willingness to use the services, and a low-level of income. Such disadvantaged groups experience difficulty in accessing and benefitting from the online services. This dissertation aims to analyse the challenges hindering the universalisation of e-government services in the context of the digital divide. It will focus on the issues from the demand side which refers to the viewpoint of citizens concerning the use of e-government. A literature review was conducted in which 42 articles were carefully selected and reviewed. The analysis of these studies has revealed that there are three main barriers which would function as obstacles to the universalisation of e-government services and those barriers are demographic, geographical and a lack of digital skills. Some theoretical and practical implications are presented.

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Attestation of Authorship

I, Khulud Alsufayri, hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Chapter One: Introduction

The global growth of Information and Communication Technologies (ICT) has been undeniable in the last decade. This growth could be attributed to the ease of access to information and knowledge through digital technologies. This new tool has influenced the livelihoods of individuals throughout the private and public sectors. Most private sector enterprises, on one hand, ensure they embrace emerging ICT to enhance their performance (Choudrie, Weerakkody, & Jones, 2005). For example, many firms depend on ICT to improve the delivery of products, speed up the running of businesses, collect and exchange relevant information, and deal with their activities. Private sector online services aim to deliver to specific groups of individuals.

The public sector, on the other hand, has recently used ICT to enhance interaction with government and its organisations, businesses and citizens. This online interaction generated from government is known as electronic government (e-government, also called electronic governance, or digital government). It seems unclear when the term e-government emerged; however, it has been estimated to be the late 1990s following the revolution of the World Wide Web (Grönlund & Horan, 2004; Yildiz, 2007). Using e-government can provide significant benefits to government and its stakeholders. E-government would enable greater availability of and accessibility to government information and public services (Silcock, 2001). It would also enhance efficiency and transparency in government processes and its interactions with citizens (Bélanger & Carter, 2009). Moreover, it would also promote public participation in making decisions in policy processes, and reduce production costs or improve cost-effectiveness (Reddick, 2011).

Many countries around the world are committed to deliver e-government services online (Choudrie et al., 2005). These countries may vary in the level of e-

government development due to several factors. These factors – such as income level of a nation, ICT infrastructure, and educational policies of a country – could be influential in e-government initiatives (UN, 2014). The absence of these factors may delay or hinder e-government development. According to a United Nations survey in 2014, the Republic of Korea was ranked number one globally in e-government ranking. The government's strategies aimed at digitalised public services when it deployed its advanced e-government strategies in 2007. The state has attained a fully online public delivery of services to its stakeholders. Moreover, Australia and Singapore were ranked second and third respectively in leading of e-government development (UN, 2014).

As many governments have implemented and improved e-government services delivery, there is concern about groups within nations who do not benefit from these services. Not all citizens have equal access to and use e-government services. Those who are younger, richer, urban, and able to use ICT are more likely to benefit from using e-government services than those who are older, disabled, computer illiterate, on a lower income, or living in the countryside (Bélanger & Carter, 2009). Despite the development of e-government and the allegedly increasing number of citizens who benefit from its services, these inequalities still prevent a large number of citizens from using e-government services (Choudrie, Ghinea, & Songonuga, 2013; Helbig, Gil-Garcia, & Ferro, 2009; Sipior & Ward, 2005). Thus, a negative outcome of e-government development can possibly lead to a digital divide among citizens within nations (Bélanger & Carter, 2009).

E-government and the digital divide have historically been studied in parallel in a disconnected fashion, although some researchers have emphasised the importance of a combined approach that takes into account digital divide concerns as part of e-government initiatives (Carter & Weerakkody, 2008; Helbig et al., 2009). Thus, it can be correctly argued that to accomplish an effective implementation of e-government, a

state has to learn about the digital divide, especially since the digital divide concerns the intersection of race, class, gender, and geographical distance in relation to technology and society (Helbig et al., 2009). Moreover, learning about the digital divide would help to create more comprehensive policies when deploying e-government services (Helbig et al., 2009).

Understanding the intersection between e-government and the digital divide has important research implications as well as practical implications. Research in the areas of e-government and the digital divide have developed in parallel with little synergism between them (Bélanger & Carter, 2009; Helbig et al., 2009). Just over four per cent of published research has investigated the link between the digital divide and e-government (Hernández, Bolívar, & Muñoz, 2012). While the practical implications of understanding the intersection between e-government and the digital divide would help a state in achieving one of the main objectives of e-government – universalisation of e-government services. This outcome would engage more groups of individuals in using e-government services. This dissertation contributes to the existing literature on e-government by investigating the growing need to understand the intersection between e-government and the digital divide. It focuses mainly on the demand side of the issues that hinder e-government services not being universally used by all citizens. The demand side refers to citizens' perspectives on using online public services. The research question this study addresses through a critical examination of the relevant literature is:

What are the major challenges hindering the universalisation of e-government services within nations?

The relevant literature will be critically examined and analysed in order to find an answer to this research question.

   This dissertation has begun with this brief introduction. The following chapter provides a theoretical foundation of an overview of e-government and the digital divide and their intersection. The third chapter of this dissertation presents the research method. Then, chapter four analyses the challenges of the demand side of e-government services in the context of the digital divide. The final chapter concludes the dissertation with a summary of the main issues, and the theoretical and practical implications will be discussed.

Chapter Two: Theoretical Foundations

The existing literature has been increasingly focused on the fields of e-government and the digital divide separately. There has been some recent interest in studying both fields together due to the importance of the intersection between them. Yet it seems difficult to attain the provision of e-government services for all citizens without tackling the issue of the digital divide. This chapter will focus on the intersection of e-government and the digital divide. This intersection has been examined from several perspectives and in several contexts. This includes a focus on the supply side of e-government which involves examining the technological delivery of public services. For instance, some studies have examined the challenges of technological issues which may face the penetration of e-government development (Layne & Lee, 2001). Others have studied government policies and strategies for e-government by examining the development of information kiosks (Ya Ni & Tat-Kei Ho, 2005).

For the purpose of this study, this chapter will focus on the intersection of the demand side of e-government and the digital divide. Primarily it will discuss several definitions of e-government, its potential benefits for citizens, its challenges, and the definition of the digital divide. Lastly, it will discuss the importance of understanding the intersection between e-government and digital divide.

2.1 Electronic Government

Electronic government has been studied by various disciplines: business, political science, public policy and sociology (Joseph, 2013). This diversity in the multidisciplinary literature could explain the complexity in finding a clear definition of e-government. In this section some definitions of e-government will be discussed, and the definition that will be used for this dissertation will be introduced. In addition, it will discuss some of the potential benefits of e-government for citizens including availability and accessibility; accountability and transparency; e-participation; and the cost

effectiveness of e-government. Moreover, it will discuss some e-government challenges such as poor management, legal barriers, and lack of awareness.

2.1.1 defining e-government

The term 'e-government' has been used in several definitions. Generally speaking, e-government refers to the use of ICT, particularly web-based applications, to deliver government information and public services (Edmiston, 2003). Similarly, e-government can mean the use of the Internet as a tool for improving the provision of government services (Alghamdi, Goodwin & Rampersad, 2011). Other definitions of e-government illustrate the interaction between government and citizens, government and employees, government and businesses, and government and other government agencies through the use of digital channels (Silcock, 2001). Therefore, e-government can be divided into several categories based on the interaction between government and the beneficiaries of e-government services.

E-government can be divided into three categories (Evans & Yen, 2005). The first category is Government-to-Citizen (G2C) which facilitates an effective communication link between government and its citizens via digital media. Citizens would benefit from these online public services such as birth and death registrations, online tax returns and e-voting. Traditionally, these services might take longer if people had to wait in queues or wait for applications to be posted. For example, if a person wanted to register a baby's birth, they would be required to visit a local authority's office during working hours and wait for their turn to submit the request. By contrast, using an online service would facilitate easier services at a citizen's convenience to submit the application online.

The second category is Government-to-Business (G2B) which generally describes the online interaction link between government and commercial businesses. It helps cut costs and improve access to information. The purpose of this category would

be to provide online regulations for organisations and increase the development of an

electronic market for government procurements (Evans &Yen, 2005). It would prompt

government electronic tender services to provide fair competition for government

business opportunities, and help governments retrieve data to evaluate and enhance

decision-making (Evans &Yen, 2005).

The third category is Government-to-Government (G2G) which refers to

improvements in the efficiency of service delivery within government agencies and with

other governments. This enables online sharing of data and information within

government authorities and reduces the duplication of information (Evans & Yen,

2005). Thus, the e-government revolution, through digital media, has changed the

relationship between government and its citizens from a one-way direction to a two-way

direction twenty-four hours a day, seven days a week (Silcock, 2001).

These e-government definitions have some limitations. First, the concept of e-

government may mean different things to different groups (Grant & Chau, 2005).

Second, besides the ambiguity and poor definition of e-government, e-government is the

object of considerable 'hype and promotional efforts' (Yildiz, 2007, p.655). Finally, it

may be not precise what exactly e-government project is in term of the level of

interactions between governments and their stakeholders. For instance, is a one-way

government website enough? Or is a greater level of online communications required?

(Yildiz, 2007).

However, for the purpose of this dissertation, e-government can be defined as

'[the] use of information and communication technologies in government to provide

public services' to all citizens (Gil-Garcia & Luna-Reyes, 2006, p. 639). This definition

focuses on the use of digital technologies to deliver online public services. More

specifically, it highlights only the category of G2C where the citizens and governments

interact and communicate online. It will not look at the supply side within this

communication but it is interested in the area of citizens' perspectives when interacting with government authorities via Internet. This point of view is also termed a demand side (Taipale, 2013). It involves understanding citizens' views about using e-government services. Traditionally, every citizen would need, at certain life stages, to contact government agencies. By moving toward e-government initiatives, it would be worthwhile to examine if all citizens have equal opportunities to use e-government services or not. This dissertation attempts to shed light on the issues that may hinder citizens from using e-government services as found in the literature.

2.1.2 benefits of e-government for citizens

This section presents the potential benefits citizens gain from using e-government. It discusses the potential benefits from implementing effective e-government services. Proponents of e-government stress that there are potential benefits for citizens (Jaeger & Thompson, 2003). Recent literature has highlighted the benefits that could be obtained from effective e-government. E-government would enable greater availability and accessibility to government information and public services (Torres, Pina, & Acerete, 2005; West, 2005). It may also reduce corruption, enhance transparency and the accountability of the internal administration of government organisations and their interaction with citizens (Bélanger & Carter, 2009). Not only this but it could also promote public participation in making decisions in the policy process, and reduce production costs or improve cost-effectiveness (Ask, Hatakka, & Grönlund, 2008; Wescott, 2001). The following sub-sections discuss the benefit of e-government including availability and accessibility, accountability and transparency, cost effectiveness and electronic participation.

2.1.2.1 availability and accessibility

E-government would boost the availability of and accessibility to government information and services. The availability of information through digital technologies

enables citizens to access information anytime and anywhere if a citizen has access to the Internet (Silcock, 2001). E-government services can be accessible to citizens unlike the traditional form of service delivery where citizens had to visit local government offices or contact them by phone during work hours to request such a service. With this traditional form of working government could be available to its population only during work hours and five days a week. But this limited contact is not suitable for many citizens (Evans & Yen, 2005). Citizens are committed to their jobs and may not want to take away time from their working day to queue in order to obtain government services. Citizens may prefer to contact government services by digital means for their convenience (Evans & Yen, 2005).

However, despite the widespread progress that has been made in launching public services through digital media, not all citizens have equal opportunity to access the available information (West, 2005). The unequal access can be observed in both industrialised and emerging countries; not all citizens are sharing the benefit of technology (Abanumy, Al-Badi, & Mayhew, 2005; Manoharan & Carrizales, 2011). Individuals who are poorer, less educated, elderly or disabled do not have the same opportunity for access as others who are richer, well-educated, younger or able-bodied. This shows there could be an inequality of access to electronic government amongst population which, in turn, reduces e-government's benefits with respect to some citizens (West, 2005).

To overcome this difficulty, governments have attempted to focus on universal access policies to ensure that all citizens have equal opportunity to benefit from available services. The US, Canada and Australia have led the initiatives to address this issue (Muir & Oppenheim, 2002). For example, Australian government efforts have included the launch of several projects such as The Online Public Access, which provides Internet access through public libraries, and the Telecommunications Action

Plan for Remote Indigenous Communities (TAPRIC) to improve telecommunications services to indigenous communities (Dugdale, Daly, Papandrea, & Maley, 2005). Access to ICT could be necessary but the issue may go beyond the access divide. It probably includes other divides such as demographic differences among citizens and their IT skills to obtain e-government services.

2.1.2.2 accountability and transparency

It has been argued that e-government would reduce corruption and enhance transparency and accountability (Bélanger & Carter, 2009). E-government has the potential to monitor a government's employees more effectively (Shim & Eom, 2008). When a government implements electronic services and transforms transactions and tasks into electronic forms, employees find it difficult to engage in fraudulent behaviour. This may be because tasks are systematically traceable. E-government would keep traceable electronic records which can be made accessible to the public. As a result, it would be easy to identify those in charge of particular activities.

For example, governments have made progress in implementing e-government systems to reduce corruption. This can be seen in the case of South Korea. The Online Procedures Enhancement for Civil Application (OPEN) system in the South Korean government is an example of adopting an electronic service for that purpose (Kim, Kim, & Lee, 2009). This system reduces human involvement in government services. Before implementing the OPEN system, local governments suffered serious issues of corruption and fraud. For instance, if a citizen applied for a government service, they had to wait for a couple of weeks unless the citizen chose to speed up the process by offering a bribe. The OPEN system allows citizens to trace the process of their applications (Kim et al., 2009). This example shows that e-government has a positive impact on combatting corrupt behavior by effectively improving direct communication

between citizens and the government sector and improving government transparency and accountability.

By contrast, some scholars are skeptical that ICT is able to reduce corruption in the real world. This skepticism could be attributed to the idea that ICT could be misused for purposes of corruption (Garcia-Murillo, 2013). ICT could lead to finding new ways for corruption to occur. That is, ICT can be only a tool and could not remove steps from the context of a country's administration. It is commonly believed that e-government is implemented in order to reduce corruption; this is contrary to the interests of corrupt politicians and bureaucratic administrations who could attempt to block any initiatives to implement e-government systems (Bhuiyan, 2010).

2.1.2.3 cost-effectiveness

Using e-government services would reduce costs and time for citizens (Ask et al., 2008; Carter & Bélanger, 2005; Wescott, 2001). Citizens could be able to receive cheaper and faster services. It can reduce the cost of travel for citizens to process an application in government offices. Instead, citizens could access online services to process a service. It would also save time, thus, citizens are not required to wait in a long queue for service as in the traditional method of an in-person visit to government offices. In fact, for citizens with work commitments it is sometimes hard to spend time waiting for services and citizens are constrained by government working hours. With the availability of online services twenty-four hours a day, seven days a week, individuals can seek public services at their convenience and cut the cost of travel (Silcock, 2001).

2.1.2.4 electronic participation

E-government has the potential to encourage public participation in policy-making and increase the number of democratic societies (Phang & Kankanhalli, 2008; Shirazi, Ngwenyama, & Morawczynski, 2010). The key aspects of electronic

participation (e-participation) can be categorised based on three levels of interaction (Reddick, 2011). These categories are termed managerial, consultative and participatory levels. The managerial level is directed by governments and initiated in a one-way direction. This level focuses on the efficiency of service delivery such as public information on websites. Reddick (2011) highlighted the main issues in this level which included limited government interaction with its population and a focus on citizens and customers. The consultative level is two-way interaction directed by the government. Unlike the managerial level, the role of government is focused on citizens in order to enhance policy decisions with the nation's input. One of the technologies that use this model is social media technologies. The main challenge at the consultative level would be that the information is directed by the government while citizens engage more in public policy processes (Reddick, 2011). Finally, the participatory level has increased the level of interaction between citizens and government to shape public policy. At this level there is a complex flow of information between citizens and government in many directions. Unlike the two previous levels, the participatory model may change the policy through the initiatives and comments of the citizens. The main advantage of this level is the possibility of enhancing electronic democracy. Some of the technologies used in these models are e-voting systems and online opinion polling (Reddick, 2011).

Unlike hierarchical administration methods, e-participation has the potential to increase citizens' participation and involvement in public decision-making. Traditionally, only a few citizens were able to participate and be involved in the policy-making process. With the availability of online government forums, citizens can effectively express their opinions and receive feedback directly through the digital media. E-participation enables citizens to participate anywhere and anytime they want which is faster and easier than the traditional way (Shim & Eom, 2008).

2.1.3 e-government challenges

This section attempts to highlight some of the challenges of e-government initiatives. While many governments have been investing in developing e-government services, some of these initiatives are not fully successful (Heeks, 2002). For instance, more than 80% of e-government projects have experienced either complete or partial failure during the implementation process (Heeks, 2002). The current literature has emphasised a number of challenges which hinder e-government initiatives. One of these challenges is poor management of e-government projects which could lead to the delay of the outcomes of the project or total failure (Rana, Dwivedi, & Williams, 2013). Moreover, legal barriers have been concerned to challenge the use of e-government (Rana, Dwivedi, & Williams, 2013). The lack of awareness among citizens about e-government services has also been a concern (Edmiston, 2003). The following sub-sections will discuss each of these challenges in more detail.

2.1.3.1 poor management

Poor management has been among the main obstacles to e-government. Poor management of technology investment can cost a project hundreds of millions of dollars more than what was originally planned resulting in project delivery taking longer. For example, the US federal government has stated that they have delayed in the transformation of government paperwork to an electronic format 'due to poor management of technology investments' (Office of E-Government, n.d.). In 1992, the government of Bangladesh began investing US$440,000 into the Bangladesh National Data Project (NDB) over a two-year period. It was planned to provide data and information support to many levels for a variety of stakeholders. The NDB was intended to link ministries with network connections to exchange information. It was found no database had been established nor any statistical data stored. The project

totally failed because of the lack of technically capable staff to keep the project running and lack of leadership (Anonymous, 2008).

2.1.3.2 legal barriers

Legal issues, such as privacy and security, are a widespread concern (Moon, 2002). Users of e-government need to feel assured, for example, when involved in e-government transactions, that their personal data will be protected and used for the purpose of benefitting them and not just monitoring data (Bélanger & Carter, 2008). The requirements for rigid security in the public service seem to be relevant. Otherwise, citizens could be affected by privacy breaches. For example, the mental health records of a patient who was a victim of sexual abuse were exposed via Partners Healthcare system (Peel, 2012). This case was accidently released to the public when e-mails were sent by ACC in New Zealand. The email contained critical information from the patient's record which was considered to be private and fully secure from penetration. This experience of privacy breaches of sensitive information could result in a lack of trust in the data holder (Peel, 2012). The concerns about individual privacy and security would appear to affect the use of e-government services negatively.

As the diffusion of ICT has been increasing in societies in terms of online public services, concerns of identity theft and loss of one's privacy have been also raised (Pavlou, 2003). Citizens generally require assurance or a remedy to exist against any misuse of citizens' information. Clear, firm penalties are required for those who steal or sell a persons' information. Such penalties would provide citizens with certain level of confidence to use online services.

2.1.3.3 lack of awareness

The lack of awareness about e-government services among citizens represents a challenge to the potential benefits e-government. This issue has been highlighted in the current literature as 'selling e-government', 'lack of awareness' and 'marketing e-

government' (Edmiston, 2003). This issue differs somewhat from the aforementioned barriers because it may not be costly but simply affect non e-government users. For example, it was found in some European countries that one of the most common reasons for not using e-government services was the lack of awareness of relevant e-government website addresses, and the available services (Aerschot & Rodousakis, 2008). Likewise, it has been found one of the main reasons Singaporean Internet users give for not using e-government is the lack of knowledge about the services (Li, Detenber, Lee, & Chia, 2005). If Internet users know about the benefits of the available online services, they will be more likely to access them. Advertising the availability of e-government services and educating citizens about their benefits would increase the number of citizens able to access and use the public services (Edmiston, 2003).

This section has discussed several definitions of the concept of e-government. For the purpose of this dissertation, it has defined e-government as '[the] use of information and communication technologies in government to provide public services' to all citizens (Gil-Garcia & Luna-Reyes, 2006, p. 639). It has also discussed a number of e-government advantages for citizens and some challenges. The next section of this chapter will discuss the concept of digital divide and its definition.

2.2 Digital Divide

The diffusion of digital communication can be seen in most everyday life activities. Many individuals depend on ICT in different forms to improve and facilitate their daily activities. For instance, individuals can communicate with their relatives and colleagues. They can also access libraries and use their resources, and look for jobs. Not only this, but citizens can interact with their governments online at their convenience. However, not all nations gain the possible advantages of ICT for a number of reasons. For example, people who are richer, younger, urban and able to use ICT are more likely to benefit from the available services than those with lower levels of income who are

older, rural and computer illiterate (Bélanger & Carter, 2009). The concern about unequal access to the digital technologies has been raised since the mid-1990s (van Dijk, 2006). This issue of unequal access is known as the digital divide (van Dijk, 2006). Since the late 1990s, numerous studies on the digital divide have been published (DiMaggio & Hargittai, 2001; Min, 2010; Walsham & Sahay, 2006). For example, hundreds of academic conferences were committed to the issue of the digital divide in the period between 2000 and 2004 (van Dijk, 2006).

Van Dijk (2006) has argued that the most challenging aspect of the literature on the digital divide is still a lack of clarity in its conceptual explanation and definition. In simple terms, the digital divide is often described as a gap between the 'haves' and the 'have nots' (Compaine, 2001). In this simple definition the 'haves' are those individuals who have access to technology and computers, whereas the 'have nots' do not. It is claimed that this access divide will, to some extent, eventually be closed over time as has happened with other technologies in history (Compaine, 2001; Thierer, 2000). They predicted that the access gap will be closed as a result of the increase in the possession of computers and consequent Internet connections. However, it could be argued that the digital divide may not be only about physical access and that the divide may persist or continue to be even wider in the future (Min, 2010). These views are based on the reasons which follow.

First, Compaine (2001) and Thierer (2000) have been criticised for failing to recognise the differences between the diffusion of ICT and the propagation of other technologies such as radio and telephone (Min, 2010). Print media, TV and radio, due to their simplicity, have been used by both lower- and higher-educated people. In contrast, ICT – especially computers and the Internet – are more complex.

Secondly, the amount of information and knowledge, which can be generated by the Internet is massive. Unlike other technologies, Internet users need to have a certain

level of skill to be able to search, select and process from a vast number of available sources. It seems that simple, equal access for everyone to ICT may not necessarily mean that the information gap within nations or between countries will disappear over time (Min, 2010).

Overall, it seems that physical access to digital technologies is necessary but other forms of the digital divide – such as required skills and demographic differences – may continue (Baird, Zelin, & Booker 2012). These forms of the digital divide have been emphasised in the existing literature.

The forms of the digital divide can be broken down into motivational access, material access, and skills access (van Dijk, 2006; van Dijk & Hacker, 2003). Firstly, motivational access refers to the first experience of using new digital technology which could depend on personal interest. It is suggested that the psychological nature of individuals may affect the use of a technology. This phenomenon is known as 'computer anxiety' which describes a feeling of stress, discomfort or fear when dealing with computers (Brosnan, 1998). Van Dijk (2006) has stated that computer anxiety can be seen more among older people, those with a lower level of education and some females. Secondly, material access includes physical access to digital technologies. For instance, PCs or network connections are necessary to leverage the advantages of ICT, that is the physical access that has been discussed previously in this section concerning the haves and have nots.

Thirdly, skills access – which is required to interact with the computer and the Internet to retrieve relevant information and knowledge – is itself divided into three levels: operational skills, informational skills and strategic skills (van Dijk, 2006; van Dijk & Hacker, 2003). The term operational skills refers to the ability of individuals to be able to operate the hardware and software. Informational skills refer to the ability to search, select and process information and knowledge using digital media. The

advanced level of skills access refers to strategic skills which enable an individual to use information for a particular purpose in society.

For the purpose of this dissertation, the digital divide can be defined as 'the gap between individuals … and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet' for e-government services (OCED, 2001). This definition reflects various differences among individuals within a nation. The ability of individuals to take advantage of the Internet to access and use e-government services differs within a country. Not all citizens have equal opportunity to access e-government services. In addition, the digital divide among citizens appears to depend on the actual effective use of online services. Citizens' demographic characteristics, geographic locations, and IT skills could play role in the use of e-government services. For example, the differences in physical access, age, income, gender, ethnicity, disability, education and IT skills required would possibly influence the effective use of e-government services. Also individuals who reside in rural or far-away areas would not have the same opportunity as those who live in urban areas.

To sum up, the foregoing sections have discussed both e-government and the digital divide in parallel. The aim of this dissertation is to highlight the importance of the intersection between these areas. Understanding the intersection between e-government and the digital divide could contribute to both research implications as well as some important practical implications. The next section will discuss this intersection and its importance.

2.3 E-government and the Digital Divide

There is an intersection between the fields of e-government and the digital divide (Helbig et al., 2009). Both fields intersect in three areas. The first area is where e-government and the digital divide rely on the role of technology (Helbig et al., 2009).

From this perspective, ICT has the potential to enhance e-government applications and to reduce inequality of access. The second area is where both fields have been focused on the role of social and organisational factors. Scholars of e-government and the digital divide have attempted to understand the impact of these factors in both fields in parallel. For instance, some studies of e-government have attempted to measure the factors that could affect the success or failure of e-government projects. Similarly, a number of digital divide studies have looked at the impact of social and organisational factors on the digital divide. The third area is where each field has moved towards more complex social phenomena (Helbig et al., 2009). For example, recent e-government research has attempted to explore the effects of the relationship between social, organisational, political and technical factors with respect to the level of success and failure. In a similar way, digital divide research has argued that the social, organisational, and political factors are as significant as technical factors with respect to the digital divide (Helbig et al., 2009).

E-government and the digital divide intersect in the way they have been developed and explored. Thus, it could be argued that to achieve an effective implementation of e-government initiatives, a state has to learn about the digital divide since it concerns the intersection of race, class and gender in relation to technology and society (Helbig et al., 2009). Moreover, learning about the digital divide would help to create more comprehensive policies when deploying e-government services (Helbig et al., 2009).

Although one of the main goals of many governments is to universalise e-government services, not all citizens have equal opportunity to access and use e-government services. Universalising e-government services to all citizens may require that e-government strategies include the issue of the digital divide. It is imperative to study e-government initiatives in relation to the enduring issues manifested by the

digital divide since e-government will probably contribute negatively to the digital divide if both areas of study are not in parallel (Bélanger & Carter, 2009). Individuals who are disadvantaged by not receiving ICT benefits will be further excluded from the available e-government services. The ones who are richer, younger, urban and able to use ICT are more likely to benefit from using e-government services than those with lower levels of income and who are older, rural and computer illiterate. It is hard to talk about the impact of the Internet on political engagement while there are still some citizens who do not have the opportunity to benefit from online public services (Hargittai, 2002). Despite the development of e-government and the allegedly increasing number of citizens who benefit from its services, these inequalities still prevent a large number of citizens from using e-government services (Choudrie, Ghinea, & Songonuga, 2013; Sipior & Ward, 2005).

Overall, electronic government and the digital divide appear to be complex phenomena. Bridging the digital divide in e-government development has become a focus of interest to both policymakers and researchers in recent years (Bélanger & Carter, 2009), especially when the expectation of more governments is to universalise access to all citizens. Most studies in the e-government field have focused on relevant factors and predictors which possibly hinder e-government initiatives achieving the desired access. For example, a number of studies have examined the demographic barriers (Choi & Park, 2013; Choudrie, Brinkman & Pathania, 2007; Powell, Williams, Bock, Doellman, & Allen, 2012; Reddick & Turner, 2012). A few other studies have focused on the geographical barriers as a possible hindrance to e-government development (Baird et al., 2012; Edmiston, 2003; Hermana, Tarigan, Medyawati, & Silfianti, 2012.). The issue of digital skills on e-government services has also been emphasised (van Deursen & van Dijk, 2009).

There are a few studies that critically examine the literature in terms of the digital divide issues which affect e-government initiatives. For example, Nkohkow and Islam (2013) have examined the literature of published articles and reports from governmental and non-governmental organisations relating to e-government and its challenges in sub-Saharan African countries. A similar study focused on service delivery concerns in South Africa, and was based on reviews of government documentation, and international and national reports (Mutula & Mostert, 2010). Therefore, it is worthwhile to understand the factors that hinder the universalisation of e-government. This dissertation attempts to contribute to the extant literature and focus on the demand side, specifically the issues that hinder e-government services not being universally used by all citizens. More specifically, this research aims to highlight the major challenges hindering the universalisation of e-government services. A critical examination of the relevant literature will be conducted in order to shed light on the challenges.

Chapter Three: Methodology

This dissertation is based on a critical literature review related to the challenges of universalising e-government services from the perspective of the demand side. This method was selected to answer the research question and to provide an understanding of existing knowledge about the challenges that hinder e-government services for all citizens including the current trends in this area. It provides an overview of what is already known about the area of interest of this dissertation, and to what extent this topic has been researched. It also analyses existing knowledge and identifies research gaps in the literature to provide a guide to where gaps exist for future research.

3.1 Methodological Procedures

The literature review for this study was based on desk research of the academic articles published in leading journals excluding other materials such as editorials, book reviews, conferences and symposiums. Although other materials contain significant knowledge related to this field of research, academic journals are one of the main sources for collating and sharing scientific knowledge obtained by researchers (Nord & Nord, 1995). Thus, the main focus of this study was on academic journals to answer the research question.

The procedure to find the relevant articles involved a series of systematic steps. There were several process stages including searching, collecting and prioritising articles (Webster & Watson, 2002). These three stages were considered to select the appropriate articles for this dissertation.

The stage of searching for relevant literature was initiated with search engines such as Scopus and Google Scholar. It was achieved by using a number of relevant keywords and phrases such as 'e-government challenges', 'e-government obstacles',

'electronic government challenges', 'electronic government obstacles', ' e-government issues', and 'electronic government issues'. Each keyword was attached to 'digital divide' in the search engine. The next step involved looking at the title, abstract and keywords of the articles that resulted from the search. It was important to find research articles specifically related to the impact of the digital divide on the use of e-government services from the demand perspective. This initial stage was started 1 February 2014 and concluded at the end of February 2014. This search yielded 65 articles.

After choosing the articles, the next task was to prioritise the relevant articles. This involved reading the title, abstract, introduction, and conclusion and, sometimes, the result section in order to establish the final selection. This was to ensure that each article discussed the demand side of e-government. It was also considered important that each article discussed the challenges of e-government that could hinder groups of citizens having barriers to use online public services. Any article that did not meet these two criteria was excluded. For instance, articles which studied the supply side, policies or strategies of e-government, or the equality of citizens in online political engagement were excluded. The final number of relevant articles was forty-two.

3.2 Demographic Characteristics

To fulfil the goal of this dissertation, these relevant articles were then tabulated using MS Excel 2010 software to identify the demographic characteristics of each article. Table 1 shows a list of all authors who contributed to this research, the number of their publications and the year of publication. It indicates that a total of 93 authors have contributed to the selected articles about e-government in the context of the digital divide. Only a few of the authors have contributed more than one publication. Choudrie and Reddick have contributed three publications each. This is followed by Sipior, Ward, and Zaho who have each contributed two publications and the other

authors have contributed only once. It also shows the year the articles were published

between 2002 and May 2014.

Table 1
List of All Authors Who Contributed to the Selected Articles

Author	Number of Publications	Year of Publication
Choudrie J.	3	2005, 2007, 2010
Reddick C.	3	2005, 2012, 2012
Sipior J.	2	2005, 2013
Ward B.	2	2005, 2013
Zhao F.	2	2012, 2014
Abanumy A.	1	2005
Abdelsalam H.	1	2012
Aerschot L.	1	2008
Al-Badi A.	1	2005
Allen J.	1	2016
Asgarkhani M.	1	2007
Baird J.	1	2012
Becker S.	1	2004
Bhuiyan S.	1	2010
Booker Q.	1	2012
Brinkman W.	1	2007
Chia S.	1	2005
Choi Y.	1	2013
Collier A.	1	2014
Connolly R.	1	2013
Deng H.	1	2014
Detenber B.	1	2005
Doellman T.	1	2015
Dotterweich L.	1	2008
Douglas B.	1	2014
Dwivedi Y.	1	2008
Edmiston K.	1	2003
Elkadi H.	1	2012
Evans D.	1	2005
Ferro E.	1	2011
Gauld R.	1	2010
Gil-Garcia J.	1	2011
Goldfinch S.	1	2010
Gorla N.	1	2008
Grey S.	1	2010
Grundén K.	1	2009
Hale K.	1	2008
Helbig N.	1	2011
Hermana B.	1	2012
Horsburgh S.	1	2010
Houston A.	1	2006
Islam M.	1	2013
Jain V.	1	2011

Author	Number of Publications	Year of Publication
Jones S.	1	2005
Kesar S.	1	2011
Khan G.	1	2012
Kuk. G	1	2002
Lee W.	1	2005
Li H.	1	2005
Mayhew P.	1	2005
McNeal R.	1	2008
Medyawati H.	1	2012
Mofleh S.	1	2008
Moon J.	1	2012
Mostert J.	1	2010
Mutula S.	1	2010
Nkohkwo Q.	1	2013
Okoli C.	1	2006
Park S.	1	2013
Pathania R.	1	2007
Powell A.	1	2012
Rho J.	1	2012
Rodousakis	1	2008
Rubaii-Barrett	1	2008
Sahu R.	1	2008
Scavarda A.	1	2012
Selwyn N.	1	213
Silfianti W.	1	2012
Singh A.	1	2008
Strachan P.	1	2008
Swar B.	1	2012
Sykes T.	1	2014
Taipale S.	1	2013
Tarigan A.	1	2012
Tsitsianis N.	1	2010
Turner M.	1	2012
van Deursen A.	1	2009
van Dijk J.	1	2009
Venkatesh V.	1	2014
Venkatraman S.	1	2014
Wanous M.	1	2008
Watson E.	1	2006
Waxin M.	1	2012
Weerakkody V.	1	2005
West D.	1	2005
White P.	1	213
Williams C.	1	2013
Williams M.	1	2008
Wise L.	1	2008
Yao Y.	1	2006
Yen D.	1	2005

Author	Number of Publications	Year of Publication
Zelin R.	1	2012
Zo H.	1	2012
93 Authors	-	-

Next, the exact frequency of the contributions by the authors and their affiliations are presented. For this purpose, each article was measured as one unit and divided among the number of authors and universities (Hernández, Bolívar, & Muñoz, 2012). For example, if an article is signed by five authors, each author is assigned by one fifth, and the same for universities or institutions.

3.2.1 authors' contribution by percentage of selected articles

A total of 93 authors have contributed to the study of the subject of the challenges of using e-government services. Table 2 presents the authors who have contributed more than once on the subject. The analysis shows that Reddick is the most prolific author in this field of research (4.36 %). He is followed by Choudrie with 2.38%, and Sipior and Ward who have each contributed 1.98% of the publications. Zhoa contributed 1.60 % of the publications. The rest, 88 authors, has contributed only once on the subject amongst the chosen articles.

Table 2
Authors Ranked by Their Frequency of Contribution in the Articles

Authors	Frequency	Actual Contribution Based on Articles	Per Cent
Reddick C.	3	1.83	4.36
Choudrie J.	3	1	2.38
Sipior J.	2	0.83	1.98
Ward B.	2	0.83	1.98
Zhao F.	2	0.67	1.60
Others	88	36.84	87.71
Total	100	42	100.00

3.2.2 productive universities by percentage of selected articles

Table 3 presents the universities which have contributed more than once among the selected articles. The American University of Sharjah and the University of Texas at San Antonio were the universities that contributed the most (nearly 4.5%). Then Nottingham University Business School and the University of Hertfordshire each contributed 3.17%. The following 13 universities each contributed 2.38%: Brunel University, Gunadarma University, Miami University, Minnesota State University, Örebro University, Southern Illinois University, Swansea University, University of Bristol, University of East Anglia, University of Otago, University of Tampa, University of Twente, and Villanova University. However, 43 universities each contributed less than 2% of the publications.

Table 3
Productive Universities with Respect to the Subject

Universities	Frequency	Actual contribution based on articles	Per Cent
American University of Sharjah	4	2.00	4.76
The University of Texas at San Antonio	3	1.83	4.36
Nottingham University Business School	2	1.33	3.17
University of Hertfordshire	4	1.33	3.17
Brunel University	3	1.00	2.38
Gunadarma University	4	1.00	2.38
Miami University	2	1.00	2.38
Minnesota State University	3	1.00	2.38
Örebro University	2	1.00	2.38
Southern Illinois University Edwardsville	5	1.00	2.38
Swansea University	2	1.00	2.38
University of Bristol	3	1.00	2.38
University of East Anglia	3	1.00	2.38
University of Otago	3	1.00	2.38
University of Tampa	2	1.00	2.38
University of Twente	2	1.00	2.38
Villanova University	2	1.00	2.38
Nanyang Technological University	3	0.75	1.79
Seoul National University	2	0.70	1.67
Cairo University	2	0.67	1.60
Villanova School of Business	2	0.67	1.60
University of Arkansas	2	0.67	1.60
Louisiana State University	2	0.50	1.19
Korea Advanced Institute of Science & Technology	2	0.40	0.95
Others	36	18.15	43.21
Total	100	42	100.00

3.2.3 authors' location by affiliation

Table 4 presents the affiliation by region of those authors who contributed most to the challenges of universalising e-government use. The greatest amount of research was conducted in the Americas (39.29 %) followed by Europe (34.52 %), then Asia (19.05 %) and Oceania (4.76 %). The region which contributed the least to this area of study was Africa (2.38 %).

Table 4
Authors' Location by University Affiliation

Authors Affiliation by region	Frequency	Actual contribution based on articles	Per Cent
Africa	2	1	2.38
Americas	39	16.5	39.29
Asia	23	8	19.05
Oceania	4	2	4.76
Europe	32	14.5	34.52
Total	100	42	100.00

3.2.4 focus of the study by region

Table 5 presents the focus of the studies based on region. The most common region was firstly the Americas (33.33 %) followed by Europe (28.57 %), Asia (26.19 %), Africa and Oceania (each with 4.76 %). Only one study was focused in many countries.

Table 5
Focus of the Study by Region

Region	Frequency	Per Cent
Africa	2	4.76
Americas	14	33.33
Asia	11	26.19
Oceania	2	4.76
Europe	12	28.57
Global	1	2.38
Total	42	100

In addition, further attempts were considered to present the percentage of authors' affiliations and their focus of study. Table 6 indicates that the authors' university affiliations were predominantly in the Americas, Europe and Asia, and that these regions comprised the main focus of their studies. Nearly 31 % of the studies that were conducted in the American region were contributed by universities in Americas region, whereas 25% of the studies were conducted in Europe. The following studies were conducted in Asia by authors from Asian universities (16.76%). The balance

(27.38% of the studies) was conducted in different regions where the authors' regional

affiliation were.

Table 6
The Percentage of Authors' University Affiliation and their Focus of Study

Authors Affiliation (by Region) Focus of the Study (by Region)	Africa	Americas	Asia	Europe	Oceania	Total
Africa	2.38			2.38		4.76
Americas		**30.95**	1.19	1.19		33.33
Asia		4.76	**16.67**	4.76		26.19
Europe		3.57		**25.00**		28.57
Oceania				1.19	3.57	4.76
Global			1.19		1.19	2.38
Total	2.38	39.29	19.05	34.52	4.76	100.00

3.2.5 source of publication

The overall analysis of publication sources on the challenges to the

universalisation of e-government use indicated that a total of 23 different journals were

used for publishing 42 articles. Table 7 indicates that these articles were published more

frequently in the *Government Information Quarterly* (21.43 %), followed by six articles

published in *Electronic Government, an International Journal* (14.29 %), and four

articles published in the *Electronic Journal of e-Government*. Three articles were

published in the *Journal of E-Government*, followed by the *Information Technology &*

People which published two articles. However, the highest number of publication

sources for 18 articles which published only one article each is not listed in Table 7.

Table 7
Source of Publication

Journal	Frequency	Percent
Government Information Quarterly	9	21.43
Electronic Government, An International Journal	6	14.29
Electronic Journal of e-Government	4	9.52
Journal of E-Government	3	7.14
Information Technology & People	2	4.76
Others	18	42.86
Total	42	100%

3.2.6 methodologies used in the studies

Table 8 presents the different methodologies used in the studies. This analysis reveals that quantitative methodology was the most frequently used methodology (47.62 %). This was followed by qualitative methodology (21.43%). The analysis indicated some studies used more than one research methodology (19.05%). However, only a few studies used secondary sources, literature review or conceptual methodology (11.90% of the total studies).

Table 8
Research Methodologies Used in the Selected Studies

Method	Frequency	Per Cent
Quantitative methodology	20	47.62
Qualitative methodology	9	21.43
Mixed methodology	8	19.05
Others	5	11.9
Total	42	100%

3.2.7 year of publication

Figure 1 presents the number of studies published between 2003 and May 2014 in the context of the challenges facing the use of e-government services. Eight studies – the highest number for one year – were published in 2008. This was followed by the years 2005 where six studies were published in this year. The years 2012 and 2013 saw five publications each. This was followed by four studies each being published in 2010 and 2011.
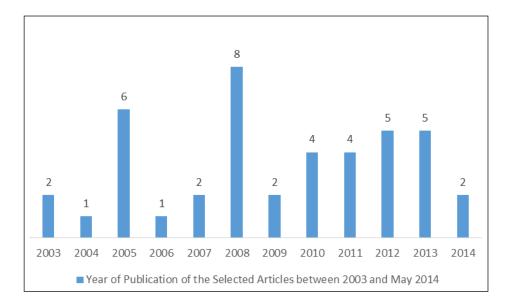
Figure 1. Year of publication

To sum up, this chapter has described the methodological procedures to select the relevant articles for this dissertation. Forty-two articles were purposefully selected which focus on the challenges of e-government services in the context of the digital divide. These articles were tabulated to present general trends such as the authors who contributed and their affiliation, source of publication and year of publication. It was shown that Choudrie and Reddick have each contributed in three publications in the area of interest. The American University of Sharjah contributed the most. In addition, nearly a third of the studies that were conducted in the Americas region were also contributed by universities in the Americas region. This analysis also reveals that approximately half of the selected articles used quantitative methodology. In terms of sources of publication, it shows that the articles were more frequently published in the *Government Information Quarterly*. Lastly, the year 2008 saw eight publications of the selected articles. Next, these articles will be analysed and the challenges that hinder the universalisation of e-government will be discussed.

Chapter Four: The Challenge of the Demand Side

Despite all the effort from governments around the globe to initiate online services for all groups of citizens, there are still some populations who cannot take advantage of such services (Bélanger & Carter, 2009). This chapter aims to highlight the main barriers blocking the universalisation of the use of e-government services from the perspective of the demand side. These barriers have been captured and analysed based on the forty-two selected articles which were presented in the previous chapter. The pattern which has emerged from the literature highlights the most challenging issues facing nations which are not using e-government services effectively. The emerging pattern categorises three main barriers: demographic, geographical and digital skills. The disparities between individuals in terms of demographic differences such as age, gender, disability, income, race and education impact the use of e-government services. Moreover, faraway areas may suffer from a lack of ICT infrastructure and the uneven dissemination of online services and these deficits could also hinder the equal use of e-government services. In addition, disparities in ability to use digital technologies in order to efficiently and effectively retrieve online information and take advantages of the digital technologies would impact the use of e-government services.

Many scholars have emphasised these barriers which can hinder many e-government developments to universalise online services. The following sections discuss these issues in more detail.

4.1 Demographic Barriers

Based on the selected studies, demographic barriers have been found as predominant themes hindering universalising e-government service. Some groups of individuals who are digitally disadvantaged could be further excluded from the benefits of e-government. These groups include senior individuals, individuals with limited education, lower incomes, women, ethnic minorities and disabled individuals. The

current literature has focused increasingly on these disadvantaged groups and explored the impact of their disadvantages on their use of e-government services. Table 9 shows a summary of the studies that have expressed the demographic barriers with respect to using e-government services. The analysis shows that a majority of 14 articles focused on difficulties facing some senior members of the population with respect to using e-government. This was followed by limited educational level issues (13 studies), then race, income and gender differences which were discussed by 12 studies. However, only four studies focused on the issue of disability when using e-government. The next sub-sections will discuss each of these aspects and their impact on e-government use.

Table 9
Summary of Demographic Aspects in the Chosen Articles

No.	Studies	Senior Citizens	Citizens with Limited Education	Ethnic Minorities, Low Income, and Female	Disabled Citizens
1	Abanumy et al. (2005)				✓
2	Asgrkhani (2007)			✓	
3	Becker (2004)	✓	✓		
4	Choi and Park (2013)		✓	✓	
5	Choudrie et al. (2005)	✓			
6	Choudrie et al. (2010)	✓			
7	Dwivedi and Williams (2008)		✓		
8	Evans and Yen (2005)		✓		
9	Gauld et al. (2010)		✓	✓	
10	Grundén (2009)	✓			
11	Jain and Kesar (2011)	✓			
12	Li et al. (2005)	✓	✓	✓	
13	McNeal et al. (2008)		✓		
14	Mofleh et al. (2008)	✓			✓
15	Nkohkwo and Islam (2013)		✓	✓	
16	Powell et al. (2012)	✓			
17	Reddick (2005)		✓	✓	
18	Reddick and Turner (2012)	✓			
19	Reddick et al. (2012)	✓	✓	✓	
20	Rubaii-Barretta and Wise (2008)				✓
21	Singh and Sahu (2008)			✓	
22	Taipale (2013)		✓	✓	
23	Venkatesh et al. (2014)			✓	
24	West (2005)	✓			✓
25	White and Selwyn (2013)	✓	✓	✓	
26	Yao et al. (2006)	✓		✓	
27	Zhao et al. (2014)	✓	✓		
Total		14	13	12	4

4.1.1 senior citizens

Age can be a potential predictor of the use of e-government services. Younger citizens have a positive association with the intention to use e-government services (Zhao, Collier, & Deng, 2014). Younger citizens can be more likely to take up e-government services. This observation is valid in some countries such as the UK, US, Canada, Egypt and Singapore (Choudrie et al., 2005; Grundén, 2009; Li et al., 2005; Reddick, Abdelsalam, & Elkadi, 2012; Reddick &Turner, 2012; White & Selwyn, 2013;

Yao, Okoli, Houston, & Watson, 2006). These nations have found some indications that there is a gap between younger and older citizens in the user's preferences for electronic services. For example, the use of electronic voting systems in the US, which is one e-government service, illustrates this gap between younger and older generations given that younger people tend to use this service more than older people (Powell et al., 2012; Yao et al., 2006). There appears to be a gap between young and senior generations in the US in terms of intending to vote online. This gap could be because younger generations seem to use Internet more often and, as a result, gain skills dealing with digital technologies. This could lead the younger generation to voting online, whereas a portion of older people seem to be less likely to accept learning to use a computer for voting (Powell et al., 2012). Many people belonging to an older generation are hindered from using online services; they prefer the traditional contact with government authorities (Reddick &Turner, 2012).

Another issue related to the senior population adopting and using electronic services would be the focus on non-technical factors (Choudrie, Grey, &Tsitsianis, 2010). The non-technical factors – such as interest in using an online service and gathering general information – would come before the technical aspects (Choudrie et al., 2010). They seem to be more significant than technical factors when encouraging older adults to be online users. The technical aspects such as type of broadband or speed do not seem relevant to elderly people at least when introducing the innovation. This finding suggested that motivation and interest comes before the physical access. This is in line with the study by van Dijk (2006) where it was found that motivation is an important aspect to lead non-users to go online and access the online services. Older citizens possibly require online services more because of the benefit of immediate interaction, but still not all of this group of citizens will benefit from the advantages of online services.

In addition, senior users may have visual, cognitive or physical deficiencies which are problematic with respect to accessing e-government services (Becker, 2004). Some elderly people experience reduced ability to focus on items which are close or small. Or they may have decreased visual perception which impacts clarity or the colour of items in the visual field. Furthermore, older people can have difficulties with the motor coordination necessary to move and click a mouse. Consequently, poorly designed search capabilities or complex navigation would negatively impact seniors using online services (Becker, 2004). This has to do with information architecture, a term describing the usability of the available online resources that targets different groups of citizens, especially the level of accessibility that would be required by senior citizens and disabled citizens.

Several studies have highlighted that the information architecture of government websites is relatively poor (Becker, 2004; Jain & Kesar, 2011; Mofleh et al., 2008; West, 2005). The link descriptions, navigational depth and reading complexity may possibly affect the intention of older adults to use online services (Becker, 2004). Most US state websites do not have convenient access to online services for older citizens. For example, only five per cent of the US state websites included meaningful descriptive homepage links that directed people to secondary pages with elder services. Some of these websites required an older person to click on four or more descriptive links on several pages to access the required service (Becker, 2004). Thus, it seems the length of navigation required to access senior resources in conjunction with other difficulties arising from aging, may hinder the older generation from using online services (Becker, 2004). In addition, reading complexity would be another factor hindering senior individuals. More than 90% of the content of US state websites recorded scores higher than an eighth grade reading level which indicated how the available web content can be comprehended in terms of sentence length, word count or

syllable composition (Becker, 2004; West, 2005). For some older adults, who are less well educated and have cognition issues, a fifth grade reading level is recommended (Becker, 2004). Electronic government services target almost all groups of citizens irrespective of age. In fact, the previous results show that the majority of US state websites require at least a college education or higher to understand the online content.

4.1.2 citizens with limited education

Education has also been found to be an important predictor of the demand for the use of e-government in many countries (Choi & Park, 2013; Dwivedi & Williams, 2008; Gauld, Goldfinch & Horsburg, 2010; Li et al., 2004; McNeal, Hale, & Dotterweich, 2008; Nkohkwo & Islam, 2013; Reddick, 2005; Reddick et al., 2012; Taipale, 2013; White & Selwyn, 2013; Zhao et al., 2014). This finding emphasises the importance of education level when encouraging more citizens to benefit from e-government services. It has been argued that well-educated individuals are more likely to adopt new innovations (Burgess, as cited in Dwivedi & Williams, 2008). Those individuals are more likely to use a computer and the Internet than less educated individuals. Since education would add to an individual's ability to deal with innovations, resulting in increased use of e-government services (Taipale, 2013). For example, citizens with noticeably lower levels of education would be more likely to be unfamiliar with the basic skills to interact with PCs (Evans & Yen, 2005). This positive correlation between education and the ability to use digital technologies would, in turn, impact the use of e-government services. This might be because e-government services require a certain level of ability to interact with technologies.

As mentioned above, a limited educational level among citizens regardless of the age would hinder the use of e-government services. There have been some indications that a limited level of education is associated more with some members of the senior generation. This may increase the number of obstacles the older

generation encounters in the use of e-government services. For example, the average level of education in the US for older people tends to be less than the general American population in terms of high school education or more (Census Bureau, as cited in Becker, 2004). As a result, this group of people may not have the ability to use the web application if they find it complex to understand the information on websites (Becker, 2004). The level of education would be then a key predictor for the use of e-government services. Therefore, it would be significant to educate people with information, knowledge and skills which, in turn, would result in a positive attitude to the use of e-government services. This could be observed from the significant correlation with preferences for e-government in both New Zealand and Australia (Gauld et al., 2010). Individuals who have a level of education greater than high school tend to be e-government users.

4.1.3 ethnic minorities, low income, and female

Earlier in the literature review it was noted that ethnicity, income, and gender play a role in the digital divide. However, selected studies have shown different results when it comes to who can benefit from e-government services. Unlike Internet users in general, demographic differences are less noticeable among government website users. For example, belonging to an ethnic minority has been found to be insignificant in determining the usage of e-government websites (Reddick, 2005, White & Selwyn, 2013). In addition, it has been shown that there are no significant differences among citizens with different genders and income levels in terms of using the government websites in Singapore (Li et al., 2005). Similarly, it has been found that gender and income are not significant predictors for e-government users in New Zealand, Australia and the US (Gauld et al., 2010; Yao et al., 2006).

By contrast, some other findings are inconsistent with the previous studies. It has been shown that there is a strong relationship between income level and gender

which would affect the channel choice when contacting the government in many developing countries (Reddick, et al., 2012; Singh & Sahu, 2008). Citizens who have more income and who are male are more likely to use e-government websites. For example, it has been suggested that income and gender are found to be possible predictors in Egypt, India, sub-Saharan Africa and Finland to characterise who used e-government services (Nkohkwo & Islam, 2013; Reddick, et al., 2012; Taipale, 2013; Venkatesh, Sykes, & Venkatraman, 2014). There are possible reasons to explain the above disparity in results between gender and income.

First, in terms of gender, we see that gender disparities appeared significant in the studies that were conducted in developing countries and mostly vanish in developed nations. The first possible reason may be that cultural factors influence the use of e-government (Asgarkhani, 2007; Evans & Yen, 2005; Zhao et al., 2014). For instance, on one hand, many Western cultures treat women to be independent. They have the responsibility to accomplish their own activities by themselves. One of these responsibilities could be requesting services from a government office. With the increase of e-government initiatives, there may be no differences between genders in terms of using e-government services in Western countries. On the other hand, Eastern culture tends to treat women to grow up being dependent on their chaperones. For example, a general feature of Indian culture is that they seem to be 'men-centric', and women may be inhibited from doing any activity outside of housekeeping. Consequently, in some developing countries men could be more likely to use e-government websites than women (Subramanian & Saxena, 2008). This means that embracing a new concept such as e-government may depend on culture,that sometimes the new concept could be in conflict with a community's norms. The second possible reason to explain the gender inequality is gender differentiation. This could be explained by a South Korean case study where it was found that there was no gender

inequality in e-government access but there was gender differentiation in the usage of e-government (Choi & Park, 2013). More women users seem to access e-government websites for social and cultural affairs, while male users access e-government websites mostly for matters relating to public administration (Choi & Park, 2013). The third possible reason is the interaction effect of online time and gender (Taipale, 2013); that is, if women spend more time using the Internet then they will be more likely to use e-government services. The increased amount of online time use could lead to more women accessing e-government services.

Second, in terms of income level, economic status could play a role in accessing e-government. It could be noticed that economic status appears to be significant in some developing countries whereas it was not significant in many developed nations. This could be because of a country's overall economic wealth may impact Internet diffusion (Hargittai, 1999). Poor regions with a low growth Gross Domestic Product (GDP) per capita would be most likely to find income as a key predictor in the use of e-government. By contrast, in richer countries, the expense of buying PCs or Internet connection fees have decreased over time which makes them affordable for many citizens who live in richer regions whereas they seem to be expensive to many individuals who live in poorer regions (Hargittai, 1999; Singh & Sahu, 2008). In addition, ICT infrastructure is a prerequisite to connect individuals to e-government services. Without efficient and reliable infrastructure e-government services will be available for only a certain group of stakeholders. For example, the lack of ICT infrastructure would be the most significant challenge in sub-Saharan Africa (Nkohkwo & Islam, 2013). The government of Kazakhstan has given a high priority to e-government initiatives, but poor ICT infrastructure has delayed the achievement of this goal, and in turn affects citizens' access to services (Bhuiyan, 2010). That is, general economic factors would predict a significant influence on the physical access to ICT.

However, it may not be important to define the actual use of ICT and e-government in particular (Zhao et al., 2014).

4.1.4 disabled citizens

Despite encouraging access to e-government for different groups of citizens, disabled individuals have encountered difficulties in accessing the available information provided by governments (Rubaii-Barrett & Wise, 2008). When seeking to encourage citizens to use e-government, the needs of disabled individuals must be considered. Communicating digitally with government agencies would positively affect this group. Potential e-government advantages – which were discussed earlier – would benefit those with disabilities. Regardless of other techno-disadvantaged groups, disabled individuals who live with long-term physical issues require more than technological access. That is, physical access to digital technologies may not solve the issues that hinder citizens with disabilities to access e-government (Rubaii-Barrett & Wise, 2008). Government websites need to be effectively used by individuals with special needs. The layout of the website and its design may need to be organised to meet their needs.

For example, the US federal government has amended their e-government policy to take into account the website design's usability for disabled individuals. Section 508 of the Rehabilitation Act of 1973 has been altered and states 'when developing, procuring, maintaining, or using electronic and information technology, agencies must give disabled … members of the public access to information that is comparable to access available to others' (Rubaii-Barrett & Wise, 2008, p. 54). It is an explicit policy that disabled citizens' requirements should be considered when designing a website; there needs to be effective access for them compared to other individuals.

In addition, guidelines for accessibility have been established by the World Wide Web consortium (W3C) which shows how to create the content of a website so that it is accessible to disabled individuals who experience such conditions as blindness,

deafness, or other physical disabilities. The W3C guidelines have been used as indicators to measure the level of usability for disabled individuals to access government websites. It has been suggested that the majority of US websites are not accessible to citizens with special needs (Rubaii-Barrett & Wise, 2008; West, 2005). Also, the level of access for disabled people seems to vary in US websites. While there are policies which take the needs of the disabled group into account, not all websites implement or use that guidance when considering their needs. Similar studies have investigated the accessibility and usability of e-government websites in Saudi Arabia and Oman with respect to disabled people (Abanumy et al., 2005). It was found that none of the Saudi or Omani government websites met the basic requirements for some disabled groups to be able to access and use website information based on the W3C guidelines. Moreover, the disabled group has been ignored when designing e-government websites in Jordan (Mofleh et al., 2008). The current lack of accessibility occurred because there was no existing policy to oblige the webmasters' designers to create accessibility for individuals with special needs (Abanumy et al., 2005).

4.2 Geographical Barriers

The literature has highlighted that not only citizens' demographic aspects affect the access and use of online services, but there is also a geographical divide. Current studies about the geographical barrier have emphasised two main aspects hindering equality of use of e-government services among regions. These are differences in ICT infrastructure and differences in online services. The differences in ICT infrastructure refer, in this context, to the simple physical barrier that leads to unequal opportunities for urban and rural citizens to communicate with government through online media. The differences in online services refer to the unequal dissemination of e-government services among the regions. Table 10 summarises the selected studies that have tackled the issue of geographical barriers which may hinder e-government services. Table 10

shows that a total of 12 studies have emphasised the differences in ICT infrastructure among regions whereas two studies have discussed the difference in online services amongst regions. Each of these aspects will be discussed in more detail in the following sub-sections.

Table 10
Summary of Geographical Barriers in the Chosen Articles

		Geographical Barriers	
No.	Studies	Difference in ICT Infrastructure	Difference in Online Services
1	Baird et al. (2012)		✓
2	Bhuiyan (2010)	✓	
3	Choudrie et al. (2005)	✓	
4	Choudrie et al. (2007)	✓	
5	Edmiston (2003)	✓	
6	Gauld et al. (2010)	✓	
7	Gorla (2008)	✓	
8	Hermana et al. (2012)	✓	
9	Khan et al. (2012)	✓	
10	Kuk (2003)		✓
11	Mutula and Mostert (2010)	✓	
12	Nkohkwo and Islam (2013)	✓	
13	Reddick et al. (2012)	✓	
14	Venkatesh et al. (2014)	✓	
Total		12	2

4.2.1 the differences in ict infrastructure

Many nations still do not have physical access to computers and Internet connections. Individuals who live in rural areas or distant places where there is no full coverage of ICT infrastructure, would be negatively affected and receive no benefit from ICT. E-government applications would be most likely to be affected by this barrier. Many citizens who live in the countryside or rural areas may not be able to access e-government services compared to their counterparts who live in urban areas.

Many government strategies have been attempted to ensure electronic services are delivered to every citizen. They have attempted to allocate certain strategies for building up infrastructure and providing equality of access for their citizens regardless of their geographical location or financial situation. For instance, the UK government's strategy is to ensure online public services are available equally in both urban and rural areas (Choudrie et al., 2005). However, there is a lack of broadband connection and Internet access in the rural areas which may limit citizens from accessing electronic government services (Choudrie et al., 2005). The geographical landscape may present a

difficulty to fully implementing broadband infrastructure. Citizens who live in rural areas would possibly be disadvantaged in terms of accessing e-government services. In contrast, citizens who live in urban areas would be privileged with greater accessibility to online services (Choudrie et al., 2005). Internet access in urban areas would be more likely to be robust and available compared to the access in rural areas (Choudrie et al., 2007). In other words, urban dwellers have greater access to the Internet than their rural counterparts. It appears that disparities still exist in accessibility among the different regions.

Similar findings from other studies have confirmed the unequal ICT infrastructure between urban and rural areas. Gauld et al. (2010) have suggested that non-urban locations in New Zealand are associated with low-level support for e-government and e-government users. This divide appears to be problematic for the state's aim to deliver access for every citizen. Likewise, rural residents in the US have less access to the Internet and e-government service compared to urban ones (Edmiston, 2003).

It is not only industrialised countries that have faced the issue of the lack of ICT infrastructure, but also developing countries. For instance, Egypt, Indonesia, South Africa and India are all challenged to overcome the divide of geographical distance and implement ICT infrastructure coverage to all regions (Hermana et al., 2012; Mutula & Mostert, 2010; Reddick et al., 2012; Venkatesh et al., 2014). For example, rural Indian regionals appear to experience slow progress in the diffusion of information compared with urban cities (Venkatesh et al., 2014). Consequently, there has been difficulty in developing e-government in rural India due to poor connectivity to networks, frequent power failures, and inadequate funds to provide better infrastructure (Gorla, 2008). It seems clear that not all citizens have equal opportunity to access and use e-government services. Thus, many rural dwellers need to travel to their nearest centre to obtain

government services. The availability of online government in rural areas would save time and money for those citizens.

A similar situation exists in South Africa where nearly half the population live in rural areas (Mutula & Mostert, 2010). ICT infrastructure has been not well implemented compared to urban areas (Mutula & Mostert, 2010). Insufficient ICT infrastructure has resulted in poor service delivery to citizens. This has impeded the development of e-government in the South African state. The issue of ICT infrastructure also persists and hinders the development of e-government applications in sub-Saharan countries (Nkohkwo & Islam, 2013). Kazakhstan and Afghanistan also suffer from inadequate ICT infrastructural development resulting in challenges in accessing e-government services (Bhuiyan, 2010; Khan, Moon, Swar, Zo, & Rho, 2012).

In summary, ICT infrastructure is a prerequisite in promoting and enhancing the use of online public services. The reality is that some regions and groups of country dwellers are still unable to access such services effectively. The lack of ICT infrastructure would be a barrier hindering citizens from using electronic government (Gorla, 2008; Mutula & Mostert, 2010; Nkohkwo & Islam, 2013). This problem seems to significantly impact the potential opportunities of e-government development to all citizens.

4.2.2 the difference in online services

The disparity in the dissemination of electronic service delivery across multiple regions would appear to be another issue hindering the use of e-government services (Kuk, 2003). Electronic government services are required to be equally available to the same standard regardless of the region within a country. But in fact, the quality of e-government websites, for instance, in UK rural areas is significantly lower than in urban areas (Kuk, 2003). Rural areas have a limited number of services and poor information content. The disparity of development of electronic communication by the authorities

could lead to social exclusion because of the unequal dissemination of services nationwide. Similarly, rural communities in the US have been negatively impacted by lower quality e-government services (Baird et al., 2012). More specifically, individuals in counties with higher levels of poverty have relatively fewer e-government services available to them (Baird et al., 2012). Consequently, citizens residing in the less privileged counties have less access to online public services. For example, the online payment of fines, fees or taxes is more convenient and easier for those who live in counties with higher average incomes and lower poverty levels than citizens who live in other counties. It also shows that these disadvantaged citizens have less chance to communicate with the authorities via email or receive online information about state activities (Baird et al., 2012).

The above finding suggests that the digital divide may widen within rural communities and poorer nations (Baird et al., 2012). This widening may appear in the poorer areas and where rural residents do not have the equality of access to e-government services compared to what the wealthier, urban citizens have been offered. If the people in those locations do not have equality of access to government services along with richer citizens and urban dwellers, they may be further excluded from the benefits of e-government services that are available to others. It should be mentioned that this example demonstrates how the different barriers are intertwined and impact the universalising of e-government services to all citizens. That is, geographical and demographic divides seem to overlap and could widen the e-government service divide.

4.3 Digital Skills Barriers

It was discussed earlier that IT skills form part of the digital divide and that there are some disadvantaged groups who do not have the required skills to interact with digital technologies. Information technology literacy can be a determinant in the digital divide. Not all individuals are able to interact with computers or the Internet to obtain

exactly what they want. Consequently, the lack of digital skills may prevent some individuals from benefitting from ICT. However, unlike other technological services, e-government services target all citizens who are required to interact with their states to obtain such a service. It seems significant to consider this when it comes to e-government services. Several studies have emphasised the issue of the lack of digital skills hindering one of the goals of e-government which is e-government services being available for all citizens (Choudrie et al., 2005; Ferro, Helbig, & Gil-Garcia, 2011; van Deursen & van Dijk, 2009). Table 11 presents a summary of the selected studies that highlight the issue of the lack of digital skills. It shows that a total of 11 studies have articulated the issue of the lack of digital skills as an obstacle for many citizens in not using e-government services efficiently. This barriers is now discussed in more detail.

Table 11

Summary of the Lack of Digital Skills Barriers in the Chosen Studies

No.	Studies	Lack of Digital Skills
1	Aerschot and Rodousakis (2008)	✓
2	Bhuiyan (2010)	✓
3	Choudrie et al. (2005)	✓
4	Ferro et al. (2011)	✓
5	Gorla (2008)	✓
6	Mutula and Mostert (2010)	✓
7	Nkohkwo and Islam (2013)	✓
8	Sipior and Ward (2005)	✓
9	Sipior et al. (2013)	✓
10	van Deursen and van Dijk (2009)	✓
11	Zhao et al. (2012)	✓
Total		11

A high level of IT literacy would be essential in terms of accomplishing more activities by using the Internet (Ferro et al., 2011). Individuals are required to understand how to use digital technologies to acquire particular information, yet not all individuals have the same level of digital skills. It was shown earlier that there is a diversity of users and a variety of usage levels ranging from operational, formal, informational and strategic skills (van Deursen & van Dijk, 2009). Operational skills measure the basic skills citizens have such as how to operate a web browser, an online search engine, or complete online forms. While formal skills measure citizens' ability to navigate on the Internet by distinguishing and using different menus, links and image links. Information skills measure how citizens are able to locate required information. Lastly, strategic skills refer to how citizens can take advantage of the Internet to achieve a specific goal and then take the right action to pursue this goal.

Each of these categories describes a level of users' skills to interact with several activities using the Internet. IT skills appear to be acquired through self-learning and learning by doing (Ferro et al., 2011). For example, the majority of individuals in Italy stated that they learnt IT skills by informal learning and self-attempts (Ferro et al., 2011). Given the importance of self-learning, there could be a metaphorical explanation of the digital divide and the process of digital skills attainment (Ferro et al., 2011). The

process has been compared 'to the act of climbing a set of stairs' (p. 8). Individuals who perform this action are divided into three categories: athletes, laidback, and needy.

Individuals who are designated as 'athletes' can be described in this context as those people who mainly climb stairs because of their fitness and enjoyment. In terms of technology, these people are very interested in technology and can be early adaptors of technology due to the enjoyment and other advantages they gain from using technology. Athletes are able to use the Internet in many activities in their daily lives (Ferro et al., 2011).

The second category, 'laidback', describes individuals who have the physical skills to climb the stairs but they are unwilling to do it. In other words, they have a certain level of ability to obtain digital skills by themselves but they do not have the motivation to do it. This may be because of a lack of knowledge of the payback benefits (Ferro et al., 2011).

The third category, 'needy', describes those individuals who do not have the physical ability to climb the stairs regardless of their motivation. In other words, this group of individuals may be enthusiastic about using the Internet in their daily activity but they do not have the basic digital skills to use the Internet meaningfully. It has been argued that external assistance is required for the techno-disadvantaged (Ferro et al., 2011).

The above metaphor, due to its simplification of the issue, is significant in understanding the pattern of the lack of digital skills barriers in terms of using e-government services. This could be because knowing the levels of digital skills among citizens may give a better picture of citizens' interaction with e-government services. Interacting with government websites on the Internet would require a proper level of digital skills. These skills would enable citizens to complete tasks like searching for and locating forms, downloading them and filling them in. it has been observed that

individuals have diverse levels of digital skills when they interact with digital technologies.

Based on the analysis of the selected studies, it could be argued that there are several studies interwoven within each of the metaphor categories of athlete, laidback and needy. On one hand, for example, a Dutch case study illustrates how digital skills differences among citizens could impact the use of e-government services. It has been shown that the majority of Dutch citizens have a high level of operational and formal skills in terms of dealing with government tasks on the Internet (van Deursen & van Dijk, 2009). Those citizens, who could belong to the laidback group, have the ability to perform some tasks such as clicking on links, navigating through multiple links, or locating some information in different layouts of web pages. Whereas the level of information skills and strategic skills among Dutch citizens could be lower (van Deursen & van Dijk, 2009). Those individuals who have an advanced level of digital skills would seem to belong to the athletes. They are, for instance, able to find particular information with no specifications of the webpage addresses. These differences among citizens in terms of digital skills could impact the efficient use of e-government services and result in uneven use among citizens.

On the other hand, it seems that the needy group could be found more within low socio-economic populations. Those individuals who are affected by a low level of income, limited education, or live in faraway areas could be more likely to lack digital skills. For example, some European countries have indicated that those disadvantaged groups may not have the optional ability to interact with digital technologies and use e-government (Aerschot & Rodousakis, 2008; Choudrie et al., 2005). One of the main reasons for not using the Internet (and in particular, not accessing e-government) among such groups is the difficulty experienced when using a computer. It seems that low socio-economic individuals lack the operational skills to perform Internet functions.

Another possible reason that these populations are not using e-government services could be because of the lack of external support and knowledge on how to use these services (Aerschot & Rodousakis, 2008). The majority of elderly people in the low socio-economic groups alleged that no one had shown them how to use a computer or Internet. Similarly, most of the techno-disadvantage in the US occurs within the needy group (Sipior &Ward, 2005; Sipior, Ward, & Connolly, 2013). This may indicate that governments should increase their efforts to ensure that all citizens have a certain level of skills to effectively use e-government services. External assistance and training programmes would be helpful to build up a certain level of skills. This would also help create a positive attitude to using a computer and the Internet among the low socio-economic groups (Aerschot & Rodousakis, 2008).

The needy group which is digitally illiterate can also be observed in developing countries. Many citizens in those countries have a lack of digital skills. For instance, Many Indian citizens do not have the operational skills to use e-government kiosks (Gorla, 2008). Similarly, most sub-Saharan African and South African citizens lack ICT skills which in turn may frustrate e-government initiatives (Mutula & Mostert, 2010; Nkohkwo & Islam, 2013). Likewise, the majority of Kazakhstan's citizens do not have the operational skills to interact with a PC or to use the Internet (Bhuiyan, 2010). In addition some Emirati citizens do not use e-government services due to the lack of digital skills (Zhao, Scavarda, & Waxin, 2012). These examples could indicate that many citizens in developing countries would belong to the needy group. They may require external assistances to educate them about the potential benefits of using e-government, and how theycan use the services. The lack of digital skills would prevent many citizens from interacting with authorities via e-government.

Overall, IT literacy is necessary to access the Internet. Having stated that, it is important to mention that having basic IT skills may not mean people will access and

use the Internet because usage could also depend on their motivation and interest (Ferro et al., 2011). It would be useful to better understand citizens' attitudes toward e-government use based on the metaphor postulated by Ferro et al. (2011).This could be an area for future studies.

Summary

The purpose of this chapter was to shed light on the demand side of the main challenges that hinder the universalisation of e-government services. Forty-two studies were carefully selected to analyse the issues. The studies have expressed three main challenges or barriers with respect to using e-government services: demographic, geographical and digital skills barriers.

Firstly, the demographic barrier was highlighted in the studies as one of the predominant factors in the digital divide that clearly hinders disadvantaged groups from using e-government services. Many studies have been conducted to understand how demographic factors may affect the use of e-government in different countries. Education, age and disability appear to be significant factors influencing the intentions of citizens to use online services. Portions of populations experience difficulties with access to or use of e-governments services. Persons with limited education, the elderly or individuals with disabilities would more likely have some challenges in using online public services. In addition, it was found that the economic status of individuals, their gender and ethnicity seem to be less important or, in some developed countries, not significant at all. This disparity between demographic factors may have significant impact on the intention to use of e-government services.

Secondly, the geographical barrier has also been found to impact the use of e-government services. Many governments have attempted to enhance infrastructure to narrow down the physical gap between citizens who do have access in urban areas and those in rural areas who do not. With respect to a government's provision and

commitment to enhance service delivery to its citizens via e-government, some groups of citizens still do not use these services. Citizens who reside in undeveloped areas and do not have sufficient ICT infrastructure may be further excluded while other citizens would be privileged by the potential benefit of contacting authorities by online media. In addition, the difference in the distribution of online services among regions would give citizens uneven opportunities to benefit from e-government services.

Lastly, the digital skills barriers has been emphasised as a hindrance to making the use of e-government services more popular. Citizens have various levels of digital skills which means not all of them will be able to take advantage of e-government services. A metaphorical picture of digital skills abilities has been introduced where users are likened to athletes, laidback, and needy groups. Each of these groups refers to the level of one's digital skills and the capability to use digital technologies and, in turn, e-government services. It appears that the needy group could be recognised more within low socio-economic populations whereas the athlete and laidback groups could be observed within urban and educated citizens. That is, education could play a positive role in the development of the level of one's digital skill.

Overall, the identified pattern of the challenges appears to overlap. It was discussed earlier that the barriers can be intertwined and more barriers built to exclude further techno-disadvantaged groups from the benefit of e-government services.

Table 11 summarises which studies have contributed to identifying the barriers with respect to using e-government services. The analysis shows that a majority of 34 focused on just one issue, while only a few studies discussed two or three barriers related to e-government use.

Table 12
Summary of the Selected Studies

No.	Studies	Demographic Barrier	Geographical Barrier	Digital Skills
1	Abanumy et al. (2005)	✓		
2	Aerschot and Rodousakis (2008)			✓
3	Asgrkhani (2007)	✓		
4	Baird et al. (2012)		✓	
5	Becker (2004)	✓		
6	Bhuiyan (2010)		✓	✓
7	Choi and Park (2013)	✓		
8	Choudrie et al. (2005)	✓	✓	✓
9	Choudrie et al. (2007)		✓	
10	Choudrie et al. (2010)	✓		
11	Dwivedi and Williams (2008)	✓		
12	Edmiston (2003)		✓	
13	Evans and Yen (2005)	✓		
14	Ferro et al. (2011)			✓
15	Gauld et al. (2010)	✓	✓	
16	Gorla (2008)		✓	✓
17	Grundén (2009)	✓		
18	Hermana et al. (2012)		✓	
19	Jain and Kesar (2011)	✓		
20	Khan et al. (2012)		✓	
21	Kuk (2003)		✓	
22	Li et al. (2005)	✓		
23	McNeal et al. (2008)	✓		
24	Mofleh et al. (2008)	✓		
25	Mutula and Mostert (2010)		✓	✓
26	Nkohkwo and Islam (2013)	✓	✓	✓
27	Powell et al. (2012)	✓		
28	Reddick (2005)	✓		
29	Reddick and Turner (2011)	✓		
30	Reddick et al. (2012)	✓	✓	
31	Rubaii-Barretta and Wise (2008)	✓		
32	Singh and Sahu (2008)	✓		
33	Sipior and Ward (2005)			✓

No.	Studies	Demographic Barrier	Geographical Barrier	Digital Skills
34	Sipior et al. (2013)			✓
35	Taipale (2013)	✓		
36	van Deursen and van Dijk (2009)			✓
37	Venkatesh et al. (2014)	✓	✓	
38	West (2005)	✓		
39	White and Selwyn (2013)	✓		
40	Yao et al. (2006)	✓		
41	Zhao et al. (2012)			✓
42	Zhao et al. (2014)	✓		
Total		27	14	11

Chapter Five: Conclusion

During the last decade, many governments have invested in the development of e-government services. E-government has changed the nature of the communication and interaction between citizens and governments. Despite this effort, concerns about the unequal use of e-government services among citizens remain critical in many countries. Not all citizens have equal opportunities to efficiently use e-government. Disadvantaged groups may find difficulty in trying to access to or benefit from the online services as explored in this dissertation. This dissertation takes the approach of focussing on the issues from the demand side which refers to the viewpoint of citizens about using e-government. A literature review was conducted in which 42 articles were carefully selected and reviewed. This study revealed that a total of 27 studies investigated the issue of demographic barriers, followed by 14 studies focussing on the geographical challenges, and 11 studies on the digital skills barriers. Based on the literature review, the following barriers were identified.

Firstly, the most common challenge impeding the universalisation of e-government services to all citizens within a country is the demographic one where barriers of age, gender, disability, race, income and education have their impact. A portion of individuals who are senior, disabled, on a low income, who are female, members of ethnic minorities or with limited education may encounter some difficulties in accessing or using e-government services.

Secondly, geographical barriers have been highlighted in the current literature as obstacles to the universalisation of e-government services. There seems to be an uneven dissemination of ICT infrastructure among regions within nations. Many rural and faraway areas suffer from the lack of effective ICT infrastructure which is the backbone for the online services. Moreover, there seems differences in the distribution of online

services between regions. Some rural regions have a limited number of online services compared to urban regions. These barriers could lead to unequal opportunities between urban and rural dwellers.

Lastly, the digital skills barriers have been emphasised in some of the selected studies. Groups of citizens do not have sufficient capability with respect to IT skills to interact effectively with their authorities through online services. The level of digital skills of citizens varies from operational, formal, informational and strategic skills. Based on the selected studies, citizens could be grouped – based on their IT skills – into athletes, the laidback, and the needy. The needy group seems to cause more concern and this may be observed in developing countries and rural areas. This group requires external assistance to educate them about e-government services and how to use them.

However, it has been observed that all these barriers could be intertwined. It is difficult to look at each barrier on its own. For example, there seems to be a connection between demographic and digital skills barriers; that is, the level of education may play a role in predicting the level of digital skills in citizens. In addition, there is a correlation between demographic and geographical aspects. This occurs when poorer and rural residents do not have equal access to e-government services compared to the wealthier, urban citizens. However, perhaps no one barrier should be prioritised at the cost of the other. From the earlier discussion, the demographic barriers dominate the literature, but it is not the only challenge faced by many governments wanting to overcome the challenge of the digital divide in the context of e-government services. Rather, the challenges to universalising e-government services in a country could be caused by a combination of different issues which, in varying degrees, depend on a country's socio-economic position (Nkohkwo & Islam, 2013).

From a practical point of view, this study identifies three main barriers hindering the universalisation of e-government. For one nation to achieve the goal of universal e-

government, these barriers should be addressed by taking into account the demographic and geographical aspects of each region and groups along with digital skills. For example, policymakers should consider the needs of the elderly, disabled, those with limited education in the processes of developing e-government. Moreover, advertising and promoting e-government services through education would increase the number of citizens who would be able to access and use the public services properly. This could, for instance, be achieved in a number of ways: offering mobile campaigns, training programmes by well-trained teams targeting disadvantaged groups of citizens, and by educating and assisting citizens on how to use e-government services. These tools are more likely to encourage more citizens to know about the online government services and engage effectively with these services. In addition, a government could proportionally balance the distribution of the financial resources among regions. This would assist local government to invest and develop online services among regions. As a result, it would reduce the unequal services provided to poorer and lower income areas compared to their counterparts in richer and higher income zones.

The author would like to acknowledge that this dissertation has some limitations. Firstly, it has been difficult to generalise the observing issues that have been highlighted in the selected articles. This difficulty could be attributed to the limited number of relevant articles related to the subject of this dissertation. Secondly: the analysis of this dissertation does not take into account the constitutional level of governments (ie., federal, state, or local level). Nevertheless, many of the chosen articles were focused on particular level of governments which is the central government. The aim was, in general, to provide an overview of the challenges hindering universalisation of e-government services. Having said that, a more in-depth analysis of the current literature focusing on specific level of governments need to be

explored further. This process could help us to shade more light on the intersection of e-government and the digital divide.

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