



**Factors Influencing G2G e-Government Adoption: A Case Study of
Dubai Public Sector Departments**

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By

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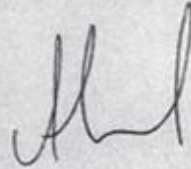
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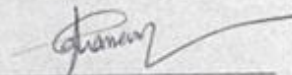
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Public Sector Departments

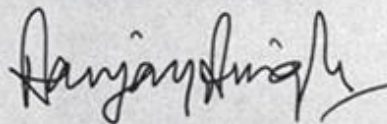


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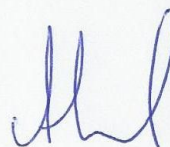
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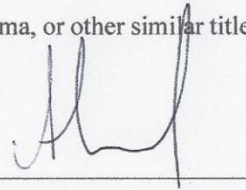
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Declaration

DECLARATION

I, Ahmad Juma Obaid Al Sayegh, do hereby declare that this dissertation, titled “Factors influencing G2G e-Government Adoption: A Case Study of Dubai Public Sector Departments”, is my own original work carried out under the supervision and guidance of Dr. Chowdhury Hossan and Dr. Sanjay Singh. I further affirm that this dissertation has not been previously submitted for the award of any degree, diploma, or other similar title of recognition.



Ahmad Juma Obaid Al Sayegh

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ABSTRACT

E-government adoption is well researched, but its influencing factors are often subjective and consequent on different influencing factors. Some studies have associated influencing factors to environmental factors or locations which all have theoretical explanations. This research aims to identify and critically assess the factors influencing the adoption of e-Government in Dubai. It examines concepts of e-government and its adoption, and a critical assessment of factors that influence e-government adoption in the UAE is conducted.

The Unified theory of acceptance and use of technology (UTAUT) model is adopted to explain adoption of e-government services in Dubai to better understand variables of e-government adoption in the city. Eight direct hypotheses and four moderating hypotheses were developed and tested in Dubai public sector departments. 172 staff from nine public sector organisations participated in this study completing a quantitative survey designed using eight factors derived UTAUT and 10-factor models.

The empirical results that shows that eight factors influence e-government adoption in Dubai public sector departments. Both gender and age were rejected as moderators of e-government adoption. The findings generated both practical and theoretical implications that informed recommendations for improving e-government adoption, and suggestions for future research informed by the rejected hypotheses.

CHAPTER 1: INTRODUCTION

1.1 Introduction to Chapter

This introduction chapter provides a brief explanation of the key construct of e-Government and the use of technology to provide public services to citizens. The chapter highlights what is already known about the adoption of e-government, the current gaps in literature in the problem statement and the justification for conducting this research. An introduction to the structure and function of UAE public sector is also presented. The objectives of the research, the research questions, research framework and hypotheses are also highlighted in this chapter. In this chapter the research methodology, scope, and thesis structure are also outlined. The intention of the research is to develop a deeper understanding of the factors influencing the adoption of e-government in public-sector organisations in Dubai.

1.2 Background to Study

In most places across the globe, Information and Communication Technology (ICT) has become a part of everyday life, impacting how people live, how they work, how companies do business and how governments serve their people (Silcock, 2001). ICT, particularly websites have become the cornerstone of every modern organization including government, helping to overcome geographic limitations and time constraints and aiding the provision of immediate, user-specific responses to the needs of

customers (Stoltzfus, 2005). At the individual level, information systems have empowered citizens, facilitating access to all kinds of information such as shopping, politics, and social activity (DeBenedictis et al., 2002). With the world becoming increasingly digital orientated, governments can no longer continue to function the way they did 20 years ago. Worldwide, governments have begun to seek ways to update their systems to deliver more efficient and cost effective services to their citizens (Marche & McNiven, 2003). As more and more governments recognize the power of the Internet, the use of e-government has risen globally with many governments turning to ICT to provide better services and to link governmental organizations to the consumers (G2C), to businesses (G2B), and other governments (G2G).

E-government is perceived differently, and it has been defined in a number of ways partly because of the different fields of practice of different authors (Grönlund & Horan, 2005). In a broad sense, DeBenedictis et al. (2002) describes e-government as all government activities that are conducted digitally or more specifically as the use of internet based information technology to improve the delivery of government services, access to information and participation of citizens and organizations in government. The use of the Internet to create “citizen-centric” government was also emphasized by (Misra, 2006). In this sense, e-government is used to refer to remote access and activities that are undertaken without human contact or face-to-face interactions.

Regardless, the definitions which emerged from the perspective of Information Science, Information Technology or Political Science, Grönlund and Horan (2005) in their review found three common themes in the definitions of e-government. Authors all seem to agree that e-government involves the use of the internet for the purpose of providing more efficient government, better services to citizens, and improved democratic processes. The working definition of e-government for this research is

drawn from Fang (2002) who defined e-government as the way in which governments use the most innovative information and communication technologies, particularly internet applications to provide citizens a more convenient access to government information and services. This definition is selected because of its reference to government's use of information and communication in relation to internet usage in relation to citizens having more and better access to government information and services.

It is also important to note that the perceptions of e-government can also vary at different levels of an organizations. For example a junior worker may perceive e-government simply as the use of computers, a mid-level manager might believe it to be putting government services online while a top-level manager's perception might be that it is reformed government services made available online to meet the needs of the citizens (Misra, 2006). Based on this information and background, e-government is about improving the quality of government services and providing more opportunities for citizens to participate in government (Fang, 2002; Komito, 2005). The extent to which is done by citizens effectively, or the level of excess provided by government is subjective.

Though not the focus of this study, the interaction between access level and effectiveness of e-government services informed the scope of this study to examine e-government within government system as transition within government could vary considerably. While the transition to web services promises more dynamic and improved government services, the adoption of e-government often takes longer than anticipated and it is rarely straightforward. Though barriers in e-government is further outlined in this chapter under problem statement, it is noticed that introducing new ICT

alone does not guarantee success, the adoption of e- government requires resources and management support to facilitate the process (Ebrahim & Irani, 2005).

One of the key barriers to e- government adoption tends to be organisational including organisational culture, management strategy and individual attitudes (Chen et al., 2006; Ebrahim & Irani, 2005). Without effective organisational support and responsive management processes most e- government initiatives begin to stall as a result of the resistance from frontline staff. Regardless, government often seem to find a way to encourage compliance or ensure that frontline staff find motivation to comply with new directives.

1.3 Background to United Arab Emirates

The United Arab Emirates (UAE) is a constitutional federation of seven emirates with Abu Dhabi city as the National capital (See Figure 1.1). The official language of the UAE is Arabic. Other widely spoken languages include Bengali, English, Farsi, Hindi, Malayalam, Mandarin, Nepali, Russian, Sinhalese, Tagalog and Urdu. The official religion is Islam but other religions are allowed to be practiced due to the limited local expertise to serve different sectors in the country.

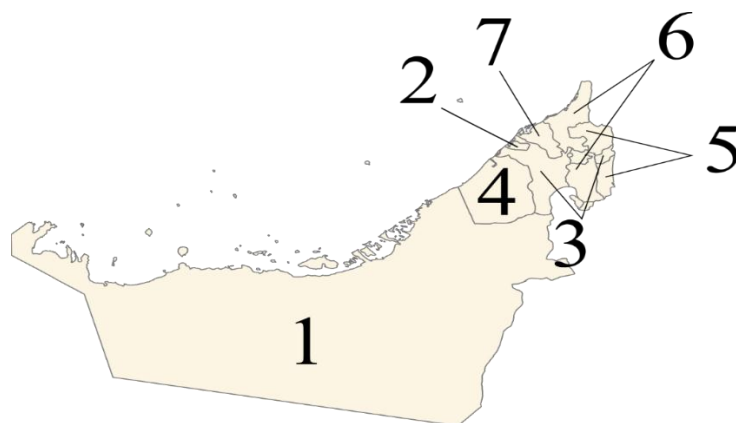


Figure 1.1: The Seven Emirates of the UAE (UAE, 2019)

As stated in Figure 1.1., the seven Emirates of the United Arab Emirates are; Abu Dhabi (1), Ajman (2), Sharjah (3), 4. Dubai (4), Fujairah (5), Ras Al-Khaimah (6) and Umm Al-Quwain (7). The UAE is located in the North East of the Arab Peninsula and covers an area approximately 71,023.6sq km including some islands in the Arab Gulf, in addition to 27,624.9sq km of territorial water. Abu Dhabi accounts for 84 per cent of the country's total landmass. The Emirati Dirham is the official currency of the UAE, abbreviated officially as AED.

All UAE citizens in the seven emirates carry the unified nationality of the UAE, which is recognised internationally. The demonym is Emirati. According to Human Development report issued by the UNDP in 2016, life expectancy in the UAE is 77.1 years (UAE, 2019a). All these factors influence the demography, economy and practices in the UAE as explained further in the next section.

1.3.1 UAE Demography and Economy

The Federal Competitiveness and Statistics Authority reports the UAE's total population (nationals and expatriate residents) as 9,304,277 in 2017. Males outnumber females 3;1, there were 6,415,942 males relative to 2,888,335 females in 2017 (UAE, 2019a). The UAE is home to residents from over 200 nationalities living and working in the UAE. Expatriates make up 95 per cent of the UAE's workforce with the largest

communities coming from South Asia. Indians form the largest foreign community in the UAE, followed by Pakistanis, Bangladeshis, other Asians, Europeans, and Africans.

The Federal Competitiveness and Statistics Authority reported 6,377,010 foreigners working in the private sector (UAE, 2019a). The UAE Yearbook 2017 states that Emirati citizens hold 27,000 jobs of the 5 million jobs in the private sector and make up 60 per cent of government sector jobs. The GDP of the UAE for 2018 in real prices amounted to approximately AED 1.6 trillion or in (US dollars: 435.70 billion) an increase of 3.4%, compared to 2017. Non-oil foreign trade generated 1.527.8 trillion dirhams in 2017. The UAE does not levy income tax on individuals.

However, oil companies and branches of foreign banks are liable to pay taxes. In addition, the UAE levies a 5 per cent Value Added Tax on the consumption or use of goods and services. The UAE holds 4 per cent of the world's oil reserves and 3.5 per cent of the natural gas reserves. The UAE has the seventh largest proven reserves of both oil and natural gas globally. Most of the UAE's reserves (95 per cent of the nation's oil reserves and about 94 per cent of its gas reserves) are in Abu Dhabi, both offshore and onshore. In 2013, the UAE was ranked third in the world in the production of concentrated solar power (CSP) (UAE, 2019a). It is therefore observed from explanation in this section that the UAE as a country is well positioned to engage and readily influenced to utilise any ICT platform to facilitate its trading and other economic activities.

Dubai is the most populous and the second largest emirate with an urban area of 4,114sq. km., which is about 5% of the UAE (Government of Dubai, 2019). There are ongoing efforts to double the size of the city with the addition of the man-made islands as well as construction in the desert (Dubai.com, 2019). Located in the northeast of the

United Arab Emirates, Dubai shares borders with Abu Dhabi in the south, Sharjah in the northeast and the Sultanate of Oman in the southeast. Its unique geographical location on the Persian Gulf gives it a strategic position for easy connection to all local Gulf States, as well as to East Africa and South Asia (Dubai.com, 2019). Dubai is a global city attracting investors, and workers from all over the world.

According to the Dubai Statistics Center (DSC) the population of the Emirate of Dubai exceeded 3.3 million by the third quarter of 2019, an annual increase of 177,020 compared to 2018 giving an annual growth rate of 5.64% (Government of Dubai, 2020). During typical peak hours, the population of the city rises to reach over 4.5 million persons. This is because the city attracts up to 1,146,000 temporarily due to work or tourism (Dubai Statistics Center, 2019). The population of Dubai has increased by 261 times in the last 100 years. Males make up 70% of the population giving a ratio of 233 Males per 100 Females (Dubai Statistics Center, 2019). Almost 60% of the population are in the 25-44 age group.

The dynamics shown in the population distribution by age and gender is a reflection of the large number of expatriates in the city. A 2015 report estimates that 85% of the Dubai inhabitants are expatriates who are mostly Indian (51%) and Pakistani (16%); other significant Asian groups include Bangladeshis (9%) and Filipinos (3%) (Governemnet.ae, 2019). This demographic pattern is also indicative of general public usage of e-government, and their cultural tendencies towards use of technology.

With regards to the economy, Dubai has become one of the fastest growing cities in the world and a global hub for commerce and business. The Dubai creek had been a centre for fishing, pearling and sea trade from the beginning of 20th century (Government of Dubai, 2019). With the discovery of Oil in 1969 the city went through rapid

development. To diversify the economy the government took a strategic decision in the 1980s to rebrand the city as a major international-quality tourism destination (Government of Dubai, 2019).

Currently, Dubai's economy is no longer dependent on oil but on trade, services and finance sectors, with a thriving business community. Dubai's GDP reached around US\$107.1 billion, with a growth rate of 6.1% in 2014 (Government of Dubai, 2019). Dubai has effectively leveraged its natural attractions to bring growing numbers of tourists to the city. There are several world-class hotels, modern architecture, major tourist attractions including the Burj Al Arab hotel, which is the world's only seven-star hotel and Burj Khalifa, which is the world's tallest skyscraper (Government of Dubai, 2019).

In addition to its highly modern infrastructure, Dubai has also invested in robust technological infrastructure to support international businesses. Dubai hosts more than 20,000 international companies. The aviation sector also plays a significant role in Dubai's economy (Government of Dubai, 2019). Dubai International Airport is the 7th busiest airport in the world, handling 70.4 million passengers in 2014. The airport is also the busiest airport in the world for international passenger traffic. The Emirates Airline is the national airline of Dubai. It operates 230 airplanes serving 140 destinations in 80 countries across six continents. The widespread service provided by Emirates airline benefits the development activities in Dubai.

Development projects in Dubai also extend to human capital development. Similar level of commitment to human capital development is also seen in the manner in which Government invests considerably in education, healthcare, culture and community development (Government of Dubai, 2019). However, many of these development

activities would not be possible without the innovation and the use of modern platform to promote, exhibit and advance Dubai initiatives. The next section examines such initiative platform used by the UAE government especially in Dubai to advance its development activities.

1.3.2 E-Government in the UAE

In the e-government survey released by the United Nations Member States in 2019, the UAE the first rank in the Arab region in all three main factors which are: the technology factor, the future readiness factor and the knowledge factor (UNDATA, 2020). Globally, the UAE was ranked: 2nd in the technology factor, 9th in the future readiness factor and 35th in the knowledge factor. The report explained that the UAE's progress was due to an improvement in the training and education sub-factor. It attributed the success also to an improvement in the:

- regulatory framework in starting a business (from 29th rank in 2018 to 15th rank in 2019)
- effectiveness of scientific legislation (from 12th rank in 2018 to 7th rank in 2019)
- positive shift in IT integration (from 14th rank in 2018 to 8th rank in 2019) mainly because of improvement in the delivery models of government services via electronic channels (from 28th rank in 2018 to 21st rank in 2019) UNDATA, 2020).

This acknowledgement of UAE's commitment to technology indicate that the country is advanced in ICT and prone to strongly advocate for e-government and its associated concepts. Subsequently, citizens and residents in the UAE are also relatively inclined to using any ICT or technology provided in the country. For instance, in 2019, the UAE

Telecommunications Regulatory Authority reported very active usage of the internet and mobile devices (Smart Dubai, 2019). The breakdown of internet use, and usage statistics are outlined in Table 1.1 which shows numbers of users in relation to its 9.61 million total population.

Table 1.1 UAE Internet usage statistics (Media Lab, 2019)

Internet users	Mobile subscriptions = 19.23million	Internet users = 9.52million	Mobile social media users = 8.80million
Device usage	Mobile phone = 99%	Computer = 71%	Tablet device = 28%
Time spent with Media	Average daily time spent on Internet usage = 7hr 54min	Average daily time spent using social media = 2hr 59min	Average daily time for TV viewing = 2h 30min
Internet use – UAE perspective	Percentage of population using internet = 99%	Active mobile internet users = 8.75million	Percentage of population using mobile internet = 91%
Internet use – global perspective	International Telecoms union = 9.11million	World bank = 9.11million	CIA world factbook = 5.37million

National Digital Guidelines provide the road map for advanced e-government which focusses on digital first and digital by default to achieve the goals of better quality, efficiency, trust, transparency, innovation, engagement, safety, digital capacity, growth, and value for all. In order to accomplish this, the UAE has identified five strategic areas to focus on:

1. Developing an IT savvy society
2. Cyber-secured data environment

3. Policies, regulations, and guidelines to achieve the Fourth Industrial Revolution's goals
4. Cultivating appropriate digital values and ethics
5. Creating a global IT hub to promote a competitive digital economy (Smart Dubai, 2019).

In 2019, the UAE was ranked first among Arab countries and the fourth globally in launching and deploying 5G networks (Carphone Warehouse, 2019). This is according to the global connectivity index 'The Connectivity Index' by Carphone Warehouse is a ranking of the world's 34 most connected countries, assessing countries that are the best connected to the rest of the world (Carphone Warehouse, 2019). The UAE's ranking was due to number of immigrants the country receives and the strength of its passport, having access to the highest number of destinations without needing to arrange a visa prior to travel (Carphone Warehouse, 2019).

The UAE is also ranked third globally in the 'Most Connected Countries' index that measures the level of communication in the countries through four areas: mobility infrastructure; information technology; global communication and social communication (Carphone Warehouse, 2019). IMD World Competitiveness Centre's report on the Digital Competitiveness measures the countries' capabilities to adopt and explore digital technologies to transform government practices. The UAE is in the 18th position amongst 63 countries reviewed indicated in the 2017 report (IMD, 2018). However, according to the IMD World Digital Competitiveness Ranking in 2019 report, the UAE was ranked first in the Arab region and 12th globally, advancing five positions from 2018 (IMD, 2019).

Therefore, it can be inferred based on these statistics and global recognition that the UAE is committed to technological advancement both in its private and public sectors.

Regardless, its digital maturity cannot be assessed based on global ranking alone, but by evaluating if the adoption of technology directly influences productivity in its public sector departments (Westland & Al-Khoury, 2010). It is also important to determine and understand if the use of technology is evenly adopted across the country especially in the government departments (Jasimuddin, Mishra & Almuraqab, 2017). Questions raised by g-government authors, suggestions for advancing e-government studies and observations of the researcher have all motivated need for this study. This study aims to advance existing studies, theories and practice of e-government in the public sector, regardless of the positive rankings that has put the country in the global spotlight.

In Dubai, the factors that influence e-government adoption within the government departments are still unknown (Mansar, 2006; Jasimuddin et al., 2017), neither can it be determined when e-government is unevenly adopted across all departments (Sarabdeen, Rodrigues & Balasubramanian, 2014; Alketbi, 2018). While this is not associated with lack of understanding or lack of knowledge and application of e-government (Sarabdeen et al. 2014; Jasimuddin et al., 2017), it is important to provide empirical explanations for e-government adoption in within the government departments and factors which influence its usage. To support this notion, a background to the current status of e-government in Dubai which is the study area is provided in the next section.

1.3.3 E-Government in Dubai

The Emirate of Dubai is the second largest of the seven constituent (states) emirates of the UAE. The UAE was formed following Britain's withdrawal from the Persian Gulf in 1971. Dubai has always maintained an air of autonomy within the federation as a result of its successful free port. Unlike its oil rich neighbour Abu Dhabi, Dubai has little oil

and the economy is mainly depended on tourism, logistics, manufacturing and services sectors (Oxford Business Group, 2019).

Dubai's strategy to building up various non-oil sectors was to diversify at a fast pace into luxury tourism, real estate and international business services. The emirate's GDP growth has been largely driven by the performance of trade related activities (Winkler, 2018). Dubai has designed its economic development programmes to leverage its strategic location between Europe and Asia, and Emirates Airline plays a significant role in bringing foreigners to Dubai, accounting for two-thirds of tourist arrivals in the country (Statista, 2016).

Aware of the importance of retaining worldwide corporations, investing in E-Government to provide convenient services to citizens, businesses, and government entities became one of the main goals of the Government of the UAE and Dubai (Governemnet.ae, 2019). In 2018, according to the United Nations database, UAE was ranked 21 of 193 countries for E-Government Development Index rising from the 29th position in 2016. UAE was also ranked 17 out of 193 for E-Participation Index rising from the 32nd position in 2016. These new positions sustains UAE's position as leading country in e-government in the middle east with Dubai as the number one e- city in the Arab World (UNDATA, 2020).

The Dubai Government established Dubai Electronic Government (Dubai E-Government) in 2000 to provide online services in a way that is tailored to the needs of its customers, employees and businesses (Smart Dubai, 2019). Due to Dubai's strategic location as a regional business hub connecting the region to the rest of the world, e-services grew rapidly from a basic website containing information about Dubai to

convenient electronic services such as paying traffic fines and utility bills, registering cars, renewing trade licenses, and applying for medical insurance (Weil et al, 2006).

Dubai's rapid development in various economic sectors meant that traditional processes needed to be continuously updated to ensure efficiency and speed. Government effectiveness became increasingly imperative especially in Government to Consumer (G2C) and Government to Government (G2G) services leading to the incumbent Smart Dubai Office. Over 130 initiatives have been launched by the Smart Dubai Office since its inception in 2015 including Dubai Data Initiative, the Dubai Blockchain Strategy, the Happiness Agenda, the Dubai AI Roadmap and the Dubai Paperless Strategy (Smart Dubai, 2019).

In collaboration with the private sector and government partners, Smart Dubai is facilitating Dubai's citywide smart transformation, in strategic partnership with the public and private sector and academia to design and implement services in line with its mission to make Dubai the happiest city on earth through technology innovation (Almuraqab & Jasimuddin, 2016). The vision of Smart Dubai is to leverage emerging technologies along with harnessing Data Science capabilities, to recreate more customized services for the residents and visitors to Dubai (Zhao, Scavarda & Waxin, 2012). To fulfil this mandate, it is necessary to understand the dynamics of e-government adoption to sustain the utilization of these technologies by all stakeholder and utilize it to its full potential.

1.4 Problem Statement

The e-Government field emerged in the late 1990s. Despite its relatively short history, there has been a lot of scientific conferences and journals and publications on several

aspects of e-government development and use (Grönlund & Horan, 2005). Any public sector organisation planning to adopt an e- government initiative must also review its business models to ensure that limiting factors within the organisation have been addressed. Governments are often a complex mix of organisations, thus getting all agencies on board may be difficult without having integrated, interconnected and interoperable systems (Ebrahim & Irani, 2005).

With workers who have already experienced one wave of e-government, it is suggested that the nature of their previous interactions with the e-Government system would also be a major predictor of adoption and continued use of new technologies particularly for high-intrusive government services (Warkentin et al., 2002). However most studies have focussed on the technology; infrastructure and resources; access and user behaviour (Zhao, Scavarda, & Waxin, 2012). Relatively few studies have examined the adoption of e-government among the frontline workers of public organisations.

As one of the global pioneers in e- government and as the number one e-city in the Arab world, Dubai has achieved rapid growth in e- government and e- services over the past decade (UNDATA, 2020). The scale up of e-government has led to improved efficiency in services and information sharing and better customer satisfaction. This rapid growth has been mostly due to the political will and commitment at the highest level of Dubai Government to modernize its administration and services (Sethi & Sethi, 2008).

While e-government has the potential to improve government-citizen engagements, its adoption by public sector workers may encounter different barriers that may impact successful deployment of these services (Bélanger & Carter, 2008). There are several barriers to the successful adoption of e- government projects that have been

documented in the studies of public sector organisations around the world (Moon, 2002). According to Titah and Barki (2006) the factors affecting e-Government can be divided into individual and organisational.

At the organisational level, the lack of financial, technical, and personnel capacities and concerns about privacy were some common barriers to the implementation of e-government reported in an international survey of municipal governments (Al- Busaidy & Weerakkody, 2009; Moon, 2002). As governments embark on more sophisticated ICT to enhance the effectiveness of e-government practices, public sector organisations require technical staff and the training and tools they need to do the job. Without fully developing staff capabilities, agencies tend to run into delays in the implementation of e-services (Arduini et al., 2010; Ebrahim & Irani, 2005).

The influence of managerial and leadership practices on e-government adoption can also be significant (Titah & Barki, 2006). Acceptance of the new technology by senior management is a factor in the adoption of e-government by the rest of the staff and so is responsive leadership, management processes and organisational culture (Burn & Robins, 2003). Moon (2002) found that organisational support was a significant positive factor in the adoption and longevity of municipal e-government initiatives. This organisational support is necessary due to the complexity and scale of the changes that will take place in the organisation during the implementation of e-government (Burn & Robins, 2003). E-government is more than introducing a new technology it also requires changes in the management of human, technological, and organisational processes which makes it a significant change effort for the public sector (Jansen, 2005).

Apart from organisational factors, individual beliefs and attitude also have significant influence on the adoption of e-Government services (Hossan & Ryan, 2016; Titah & Barki, 2006). Perceived usefulness, perceived ease of use, compatibility, institution-based trust and demographic profiles of users are antecedents to adoption of e-government reported among government workers (Chong, 2011; Mehdi, 2013). Several theories including the Theory of Reasoned Action (Fishbein & Ajzen, 1977), the Technology Acceptance Model (TAM) (Davis, 1989) and Diffusion of Innovations (Rogers, 2010a) have been used to explain the individual factors in adoption of e-government. According to Hossan & Ryan (2016) study in Australian City Councils, organisational conditions such as training, leadership support and organisational preparedness also influence eService utilisation indirectly through their impact on individual's attitudes and beliefs.

All of the above user and organisational factors are important considerations in the successful deployment and adoption of e-government. While past e-government adoption and acceptance research has identified the significant discrepancies in the levels of adoption and effective usage among public agencies (Andersen & Henriksen, 2006; Grönlund, 2005; Norris & Moon, 2005; Wirtz et al., 2017) few have successfully explained the interdependencies and non-linear relationships that exist between these factors. The Government of Dubai has invested financial and other resources to ensure success with a focus on achieving citizen-centric e-services (Smart Dubai, 2019). Yet, little independent and empirical research has been published on how workers in public service have adopted e-government. For instance, questions abound, and it is unclear what influences adoption of e-government in Dubai. Important questions remain unanswered such as;

What factors influence public sector workers to adopt technologies?

What organisational support would adequately influence the adoption of e-government?

Therefore, this study aims to provide context specific information on the adoption of e-government and the barriers faced by public sector organisations toward providing reliable and effective e- government services.

1.5 Research Aim and Objectives

Within the context of Dubai, very few systematic evaluations of the adoption of e-government in the UAE public sector are available to guide the new transition to Smart Dubai. The paucity of research on how government staff are adopting new ways of using technology means that appropriate interventions to support staff during further implementations e-government initiatives cannot be developed.

Thus, this aim of this research is to identify and critically assess the factors influencing the adoption of e-Government in Dubai, in order to determine the dominant factors that contribute to successful e-government adoption in Dubai public sector departments.

This research aim is achieved through the following objectives:

- i. To examine concepts of e-government and its adoption.
- ii. Critically assess factors that influence e-government adoption globally and in the United Arab Emirates (UAE).
- iii. To determine and assess presence of the moderating variables that influence e-government adoption in Dubai public sector departments.
- iv. To provide recommendations for enhancing e-government adoption in Dubai, and for improving successful e-government adoption in the UAE.

1.6 Research Approach and Scope

There are two general approaches to reasoning in the acquisition of new knowledge: inductive reasoning which starts with the observation of specific issues and then seeks to make generalisations, and deductive reasoning which starts with generalisations before seeking to apply findings to specific instances (Collis & Hussey, 2014). The research paradigm followed in this study is deductive approach which starts with a research hypothesis derived from existing knowledge; this hypothesis governs and constrains the research, keeping it from taking on a more nebulous quality (Holyoak & Morrison, 2005). The collection of data in this study was done with a view of using these data to verify the stated hypotheses.

This study also follows the positivist logic of argument with a belief that research statements are testable and amenable to being verified, confirmed, or shown to be false by the empirical observation of reality (Collis & Hussey, 2014). Data was collected with objectivity to demonstrate causality and to aid hypotheses testing. Positivism also aligns with deductive reasoning since positivism holds that valid knowledge is found only in a priori or empirical knowledge (Saunders et al., 2000). In this study, existing knowledge led to the development of the study hypotheses, these hypothesis guided data collection, and collected data were subjected to testing to confirm or refute the stated hypotheses. Extant literature was reviewed, and primary data was collected to investigate the hypotheses. The approach used to achieve each research objective is presented in Table 1.2.

Table 1.2 Research Objectives and Approach

No	Objectives	Approach
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i.	To examine concepts of e-government and its global adoption	Literature review of concepts of e-government to provide theoretical and empirical foundation for this study Literature review of global practice of e-government.
ii.	Critically assess factors that influence e-government adoption globally and in the United Arab Emirates (UAE).	- Review of literature to identify factors influencing e-government adoption globally. - Identified factors inform the assessment of e-government adoption in UAE to identify gaps
iii.	To determine and assess the moderating variables that influence e-government adoption in Dubai public sector departments.	- Primary data collection from different Dubai departments using e-government to identify influencing factors. - Analysis of primary data to identify the variables that moderate the adoption of e-government in Dubai
iv	To provide recommendations for enhancing e-government adoption in Dubai, and for improving e-government successful adoption in the UAE.	The results of objectives i-iii are triangulated to provide recommendations for enhancing e-government adoption in departments examined as well as other Dubai public sector departments. A general recommendation is also provided to UAE public sector in general for improving e-government adoption.

As noticed in Table 1.2, each objective follows a process where an approach or approaches are used to investigate and critically examine the themes within the objective. Chapters in this thesis are devoted to ensuring that each objective is achieved. The last chapter of this thesis outlines the findings for each objective and the extent to which objective had been achieved through the approach adopted. In addition, it is worth noting that theories or theoretical explanation play important role in undertaking a research (Collis & Hussey, 2014), this study is no exception. The next section briefly explains the theoretical underpinning informed by the objectives that influenced the research process.

1.7 Theoretical Underpinning

Technology adoption is a complex, process involving an individual's perceptions of technology which then influences their adoption decisions. Efforts to facilitate the adoption of technology adoption must therefore consider cognitive, emotional, and contextual concerns (Straub, 2009). This understanding had led to numerous studies and theories into how and why individuals adopt technology (Straub, 2009). This study examines individuals' adoption of e-government through the lens of the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) from the consolidation of eight existing models of user behaviours.

The UTAUT explained 69 percent of the variance observed in user rates and surpassed all the other eight individual models. The UTAUT identified four core determinants of intention and usage, namely; performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003). Other authors such as Hossan and Ryan (2016) research on 10-factor model which are factors that relate to organisational conditions, beliefs, e-service utilisation and individual attitudes. The work of Hossan and Ryan (2016) and the UTAUT determinants motivated further consideration to adopt and explore the moderating effect of demographic factors on the intention to use the technology which Venkatesh et al., (2003) believe is possible. Within the context of mandatory use of e-government UTAUT provides a useful tool to assess adoption of new technology and an understanding of the drivers of acceptance in order to proactively design interventions to address barriers.

1.8 Research Contributions

While Dubai government has demonstrated exceptional leadership in e-government, it is important to critically assess the factors that facilitate the translation of this policy and e-government intensions to successful outcome within the public sector departments. E-Government technology is considered to be an indicator of a nation's infrastructure readiness and well-being (United Nations, 2012), it facilitates cost-cutting in terms of time and money and significantly reduces the hassle associated with interactions with governments (Omari, 2013; Gilbert et al, 2004). These advantages have driven the Dubai Government investments in e-government technology (Zhao et al, 2012).

This research has the potential to identify the factors responsible for the rapid growth of e-government at the organizational level and the challenges that face organizations in the implementation of e-government technology to aid higher rates of return on this huge investment on e-government. A report by the Organization for Economic Cooperation and Development (OECD) indicate that numerous e-government projects with high investments yielded low rate of return or even completely failed (OECD, 2007). Identifying the success factors within the UAE can provide useful insights for other emirate governments or other governments in the region seeking to scale up adoption of e-government within similar contexts to Dubai.

This study also enriches the literature on e-government within the region. The current limited number of studies on e-government adoption in the Arab world generally tend to focus on e-government from the citizens perspective (Al Athmay, 2015; Alameri, 2013; Al- Moalla & Li, 2010), this research contributes to literature by providing findings from the perspective of government employees. Findings will further support

the successful adoption of current smart initiatives of the Dubai Government which is still in its infancy.

In conclusion, the study provides a better understanding of the factors necessary to utilize e-government technology to its maximum potential in Dubai E-Government. Academically, this study contributes to the limited studies on e-government in the Arab world generally and in the U.A.E locally from the employees' perspective rather than the citizens' perspective highlighting important determinants of e-government adoption in Dubai public sector departments.

1.9 Thesis Structure

This thesis is structured to have six chapters that address specific aspects of this study. Chapter One (Introduction to Research) introduces the research, provides the rationale for conducting the research, and outlines the research aim, objectives, and questions. The research methodology, scope, and contributions are also discussed and explained, providing background to other chapters in the thesis. Chapter Two (Literature Review) provides an in-depth review of existing literature in the adoption of e-government globally and the factors that influence e-government adoption to guide hypotheses formation and development of research conceptual framework. This theoretical foundation influences the acceptance or rejection of hypotheses when tested in Dubai context.

Chapter Three (Methodology) details and justifies the research strategy, approach, methods, techniques, and philosophy used for data collection. It explains the predominant use of quantitative methods to test the research hypotheses. Chapter Four (Results) presents and analyses the information gathered from employees of the Dubai

public sector departments with the survey questionnaire. It provides an analysis of the quantitative data conducted using statistical software. It also discusses the findings from the primary data collected through the employee survey relative to the literature findings. The purpose of this chapter is to identify major contributions to knowledge.

Chapter Five (Conclusions) discusses the conclusions of the research in relation to the research aim and how the hypotheses helped to achieve the research objectives. This chapter also discusses the research implications, limitations, theoretical contributions and suggestions for future research. It concludes the study.

1.10 Chapter Summary

This chapter has introduced the concept of e-government and the organisational factors influencing its adoption. An introduction of the study area was also presented. The content of this chapter also outlined the research objectives, questions and hypotheses and the rationale for conducting this research. The potential contribution of this study to knowledge has been highlighted. The research approach that will be used to answer the research questions and achieve the research objectives were also presented. The chapter concluded with the thesis structure. A critical analysis of the concepts of e-government, and factors influencing its global adoption in extant literature is detailed in Chapter Two. Different theories examined by different authors of e-government are evaluated to determine common perspectives on e-government, as well as gaps that exists to justify the importance and relevance of this study. The next chapter provides the theoretical foundation for this study and guide hypotheses formation and development of research conceptual framework.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter critically reviews and evaluates literature on e-government adoption and related factors in line with the research objectives. The review of literature has been shown to be useful for contextualising research, identifying gaps in the body of knowledge and clarifying what factors are linked with the phenomenon being studied. A review of previous work may also point towards potential conceptual and methodological advantages or disadvantages (Dunne, 2011). This chapter provides an overview of current concepts and approaches to e-government which is electronic government in full, its adoption and the key factors for enabling and managing the adoption of e-government in different settings.

Findings is used to support the extent to which this pool of information on e-government adoption can guide research into the adoption of e-government within the context of Dubai. This literature review will, therefore, provide the evidence base for the research framework. The key terms used in this chapter are briefly defined below based on definitions from IGI Global (2019):

- Information and Communication Technology (ICT): the term ICT is the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system.
- Information technology (IT): computers hardware, and associated software, processes, and procedures, etc.
- Impact: the consequences or results produced by the adoption and utilization of IT and e-government.
- Adoption: the act by a local government (or other unit or organization) to acquire and implement new technology, process or system. In this chapter, the concern is with the adoption of e-government.
- Digital Gap: the differential access to new media technologies. The reasons for this difference can be due to geographical, economic, cultural, cognitive, or generational differences.
- Internet: a worldwide computer network that is capable of linking all network users

These definitions are widely used in relation to e-government by different authors quoted in this chapter, and thus adopted in this research also. Further justification for this is provided throughout this chapter, especially in the next section that critically examines the concepts of e-government.

2.2 Evolution of E-Government

This section reviews the inception to e-Government in the world. Such historical background provides contexts for the use and reasons for adopting e-Government and the factors that need to be strongly considered for its successful and sustained usage. It also allures to the rationale for aligning ICT, IT and their adoption is widely connected to the internet and computers or similar gadgets.

2.2.1 E-Government Background

The history of e-Government can be traced to the 1950s when one of the leading companies in the world began the use of commercial computer. Lyons Electronic Office (LEO) is the world's first commercial computer which became operational in 1951 (Ferry, 2003). Governments were among the first to use this new technology and the use of ICT in government started and grew during the 1950s and '60s (Chadwick, 2013). It can be inferred that, this early interest of government in computer usage further influenced government continued monitoring of, and interest in computers in different countries across the world.

Despite this early interest in computers, the term “e-government” was first used in 1993 in the United States (US), after about two decades of pursuing e-government strategies (Chung & Kim, 2019). President Bill Clinton's administration launched e-government after the 1993 National Performance Review of the federal bureaucracy. The rapid growth of internet use in the 1990s soon led to other countries such as the United Kingdom (UK), Canada, Australia and New Zealand (NZ) developing their own versions of e-government (Chadwick, 2013). Though the purpose for the rapid growth vary from country to country, it was noticed that essentially everyone wanted improved processes and products (Mansar, 2006). For instance, the most common

model of e-government used globally is that which uses the internet to improve the delivery of services such as health care information provision, benefits payments (Zhao et al. 2012). Other services prioritised by countries are; passport applications, tax returns and other government service used for providing services to citizens and also to connect different government departments (Chadwick, 2013). Keen adoption of e-government in the US, UK, Canada, Australia and NZ to deliver public service motivated the UAE as an emerging economy to follow similar path.

As a result of adoption of e-government in these major developed countries, there has also been a growth in the use of mobile phone devices and internet-empowered mobile phones in several countries (Almuraqab, 2017). In countries where there is e-government, citizens are able to request for a particular government service online and receive the desired government service through the internet or some computerized mechanism. In some cases, rather than having to engage with many offices, through e-government all services can be accessed through one government office (Westland & Al-Khouri, 2010). In certain cases, some government services can accessed and all transactions completed without any direct contact with a government employee (Chung & Kim, 2019). The possibility of using varied platform beyond computers for e-government provided services increased the adoption and usage of e-government for more functions than services especially in Europe (Mansar, 2006).

In Europe, the action plan “eEurope 2005” was launched to increase productivity, improve public services, and guarantee access for the entire community to participate in a global information society, based on broadband and multiplatform infrastructures (Pagani, 2009). By 2007, the EU benchmarking report on eGovernment reported that

Austria had achieved 100% in online availability and 99 % for online sophistication such as full electronic case handling (Jasimuddin et al. 2017). There are two indicators used by the European Union to measure e-Government success (Capgemini, 2007). This is a testament to the growth of e-government.

Similarly, across the public sector in the U.S., the internet is used to provide information, deliver services, and interact with citizens, businesses, and other government agencies (West, 2003). All across the globe, e-government is being used to deliver services and information around the clock, making governments more efficient, responsive and transparent to the public through a variety of communication options that are quicker and more convenient for users (Schmeida & McNeal, 2009).

Therefore, this background indicate that e-government is prominently and successfully used for providing public service, and subsequently for getting access to the information community as well as citizen. While it may be inferred to have encouraged the IT literacy level in countries where e-government was first adopted, it helped government to provide information, engage with business and citizens regardless of their needs and promote inter-agency information sharing between government agencies (Gilbert et al., 2004; Malanga, 2016). This fundamental operational principle of e-government is important and have been provided to reveal what e-government was designed for and have been historically and successfully used for.

2.2.2 Concepts of E-Government

Governments need to interact with residents for several reasons. As a result, residents use government services for business registrations, real estate permits, school enrolment, birth registrations, vehicle registrations, and several other services. All of these services traditionally required physical contact with government offices. In order

to simplify these processes, technology was introduced to facilitate these conventional services (OAS, 2010). The use of ICT has made these daily procedures easier and more efficient for the residents in different countries and rapid growth in e-government services has ensued across the globe (OAS, 2010).

E-government has been used to refer to; online government services or to the exchange of information and services electronically with citizens, businesses, and other arms of government (UN eGOVK, 2019). The United Nations E-government Knowledgebase (2019) originally defined e-government as the; use of Information and Communication Technologies (ICTs) for improving the efficiency of government agencies and providing government services online. This definition has now been expanded to include the use of ICT by government for conducting a wide range of interactions with citizens and businesses as well as open government data and use of ICTs to enable innovation in governance (UN eGOVK, 2019).

The Organization of American States defines e-Government as; the application of ICT to government functions and procedures with the purpose of increasing efficiency, transparency, and citizen participation (OAS, 2010). According to OECD (2014) e-government is the use of ICT by governments particularly the Internet, as a tool to achieve better government. A search of IGI-Global, a leading international academic publisher that provides a database on information science to the research community retrieved 10 different definitions of e-government outlined in Table 2.1.

Table 2.1: Definitions of e-government from different authors

No	Author and Year	Definition
1	West (2003)	e-government is the delivery of information and services

		online through the internet or other digital means.
2	Garson & Khosrow-Pour (2008)	e-government is the electronic provision of governmental information and services 24 hours per day, seven days per week
3	Garson & Khosrow-Pour (2008)	The use of digital technologies to transform government operations in order to improve efficiency, effectiveness, and service delivery
4	Heeks (2008)	The use of information and communication technologies (ICTs) to improve the activities of public sector organisations.
5	Reddick (2009)	e-government explained as electronic government, e-gov, digital government or online government is the use of internet technology for exchanging information, providing services and transacting with citizens, businesses, and other arms of government in order to improve internal efficiency, the delivery of public services, or processes of democratic governance
6	Pagani (2009)	e-government is the delivery of online government services, which provides the opportunity to increase citizens' access to government, reduce government bureaucracy, increase citizen participation in democracy, and enhance agency responsiveness to citizens' needs.
7	Bwalya, Chris, & Mandla (2010)	e-government is a platform through which the government interacts with its citizens and business entities for the sake of exchange of information, public services and participatory democracy through the use of ICT platforms.
8	Chadwick (2013)	e-government is the use of ICT, particularly the Internet, in government to enhance the internal efficiency of public bureaucracies, through the automation of routine tasks and the rapid sharing of information between departments and agencies.
9	Lee (2016)	e-government is the use of information technology to

		provide government services online, to provide faster and better services for stakeholders.
10	Chhabra (2018)	e-government is the use of Information Communication Technologies (ICTs) for the automation of services provided to citizens

As noticed in Table 2.1, the definition of e-government started in the 2003 from mere provision of services to more emphasis being placed on the platforms and mediums as well as speed and quality of services in 2018. In addition to all these ten definitions, there are also different national interpretations of the term. Such definitions of e-government include views of e-government as the use of information technology, the free movement of information, to transitioning traditional paper and physical based systems online. Some definitions restrict e-government to internet-based services only, or to interactions between government and outside groups. For example, Heeks (2008) state that e-government includes all digital ICTs in all public sector activities. Regardless of the source or scope of the definition, there are common threads found in most definitions.

First, there is agreement that e-government involves the use of technology, automation or computerisation of existing paper-based procedures to share data and conduct electronic exchanges (Digital Governance, 2003). Secondly, the goal of this technological adoption is usually to enhance access to or the delivery of government services, the simplification of procedures, improve services or facilitate cross-agency coordination and collaboration. Thirdly, the primary audience for these services includes the citizens, businesses, government employees or other governments. Finally, each definition implies a switch to new ways of transacting business, new ways of

communicating with citizens and communities, and new ways of organizing and delivering information (DeBenedictis et al., 2002). Ultimately, e-government means the application of ICT in government operations and services to meet the needs of all stakeholders. In the words of UN eGOVK (2019), it is the achievement of public ends by digital means.

Literature reveals several definitions of e-government and also a range of activities used under the label of e-government. The search for relevant publications for this review considers various explicit definitions that organizations and researchers use to specify the focus of their research. This research also considers different activities that are captured under the label of eGovernment whether in academic or in practice contexts in the analysis of adoption of e-government. This approach is similar to the strategy used by Grönlund (2010) in studying the history and trends in e-government.

Therefore, understanding the core focus of each definition presented in Table 2.1 and explanations and trends of definitions are all important to this research focus especially in achieving objective one which is to; examine concepts of e-government and its global adoption. It also provides some insight into essential direction for achieving objective two which is to; critically assess the organisational factors that influence e-government adoption globally and in the UAE. As noticed from different definitions and explanations in this section, the adoption of e-government had been influenced by the need to provide public services, information sharing between government agencies and with citizens. Being able to provide such services and share information at fast pace and through the appropriate platform became a major focus of government and countries in the 2010s as implied in the definitions and history examined in this section. Thus, it implies that the global adoption of e-government is driven by these fundamental principles and reasons. The next section explores types of e-government.

2.2.3 Types of E-Government

E-government can be classified into four types based on interactions between government agencies, members of the public. According to authors such as Fang (2002), Moon (2002), Huang and Bwoma (2003), Affisco and Soliman (2006), Belanger and Hiller (2006), Heeks (2008), Gil-Garcia and Martinez-Moyano (2007), Heni, Mellouli, Karuranga and Poulin (2011) and Rana, Dwivedi and Williams (2015) these various classification prioritises different mediums and mode of operations to achieve its purpose. The four types of e-government are; government to citizen, government to business, government to employee and government to government. They are examined further.

2.2.3.1 Government-to-Citizen (G-C/G2C)

The key feature of the G2C model is that it provides information and online access to public services for citizens. This includes services such as license renewals, filing of income taxes, school registration, health care information, libraries, birth/marriage certificates etc for the citizens (Affisco & Soliman, 2006). The SmartPass project of the UAE is an example of G2C service. It provides an opportunity for unified data entry for online government transactions for UAE residents (UAE, 2019b). Users are provided with a SmartPass ID number after registration, this number is used to access all eServices of the federal and local government entities including payment of traffic fines, renewal of Emirates ID card, application for vehicle licence and payment of electricity and water bills. The portal also offers the opportunity for a user to access all previous interactions and transactions (UAE, 2019b).

2.2.3.2 Government-to-Business (G-B /G2B)

Using the internet, government agencies are able to seek bids to sell or buy goods and services (e-procurement), announce changes in regulations or disseminate policies. Businesses are also able to apply for business registration, renew licenses, obtain permits or pay taxes (Belanger & Hiller, 2006). The ease of transaction that is possible with G2B portals leads to many benefits including better decision-making, better data on business transactions and taxes (Moon, 2002).

2.2.3.3 Government-to-Employee (G-E/G2E)

In this context, services include the features of G2C services as well as specialized services that cover only government employees, such as the provision of human resource training and development that improve day-to-day functions and work processes of employees (Heeks, 2008). Services may include e-Learning sites where public sector employees can exchange information, intranet systems personnel records, policies and information (Fang, 2002). An example of G2E services in Dubai is the Ministry of Human Resources and Emiratization where government employees can access their pay slips, view and renew employment contracts, apply for work permits for expatriate staff etc (MOHRE, 2019).

2.2.3.4 Government-to-Government (G-G/G2G)

This e-government type involves services that are at the local or international level, between national and state governments. It can also be between different agencies and bureaus in the same municipality. The aim is to coordinate activities between government agencies to serve citizens better (Henri et al., 2011). Huang and Bwoma (2003) suggested that the interrelationship and intercommunication that occurs in G2G e-services could improve the management and utilization of public resources. By

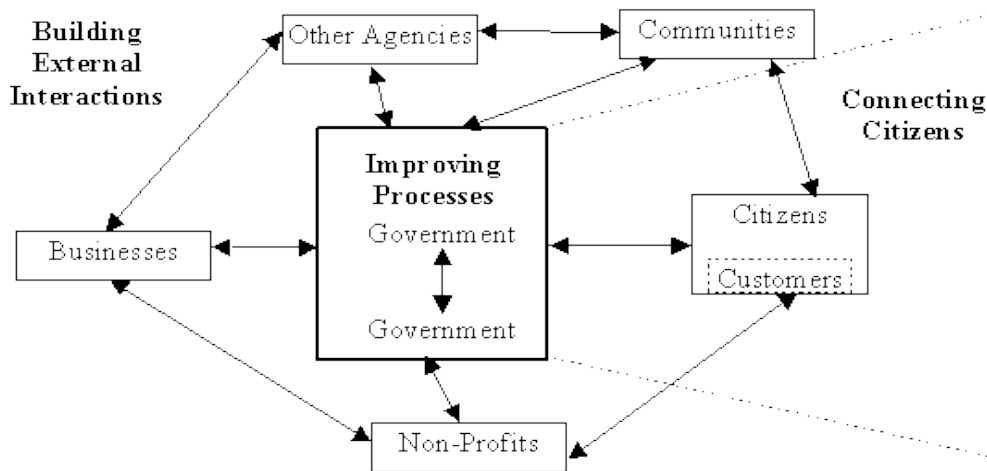
linking sites together, integrating services and grouping all services under a single Government service portal, citizens are able to access more services in less time.

However, G2G e-services depends on the public sector's readiness for e-Government and the ability to change the modes and structures of public administration agencies (Gil-Garcia & Martinez-Moyano, 2007). An example of G2G services is the UAE Government portal U.ae (previously government.ae) that provides access to all government services including those of federal and local government entities for individuals, visitors, businesses and government from a single portal. Many of the previous studies that have explored e-government adoption have looked at the government to citizen dimension of e-government (Rana et al., 2015). Depending on the level of e-government maturity, e-government may have all the four types operating in a country. Though this study explores G2E and its dimension the next section further critically examines the scope of e-government and the classification of e-government services.

2.2.4 Domains of E-Government

The utilisation different web-based telecommunication and information to improve efficiency of service delivery in the public sector can be operated within certain domains. Heeks (2008) proposes further classification of e-government services into three main domains. In no specific order, these domains are; building external interactions, improving processes and connecting citizens and communities. The relationship between these domains are illustrated in Figure 2.1.

Figure 2.1: Focal Domains for eGovernment Initiatives (Heeks, 2008)



As noticed in Figure 2.1, the three services classification resides in different domains. While building external interactions facilitates business and other agencies, improving processes is done internally between government entities or departments (Heeks, 2008). The continued and effective interactions between the first three services ensures and strengthens connecting citizens because this cannot be done in isolation. Each classification is explained further.

1. **Improving processes (e-Administration):** government operations are often very costly, inefficient and sometimes ineffective. E-government is used to address these concerns using e-administration to improve the operational processes of the public sector. The European Commission (2007) defines e-administration as the application of ICTs to support back-office administrative tasks. E-administration can be used to better manage time, finances, personnel and also to connect different agencies, link several sources of data to strengthen the capacity for data based decisions (Heeks, 2008).
2. **Connecting citizens (e-Services):** These are online services to reduce the inconvenience associated with government processes. According to Heeks

(2008), these initiatives depend on e-administration to facilitate process improvements such that the quality, convenience, and cost of services provided to the public is improved.

3. **Building external interactions (e-Society):** These initiatives connect public agencies to other public agencies, private sector companies, non-profit or community organisations to increase the connections between the government and private sector (Heeks, 2008).

These services aim to improve government processes as indicated in explanations leading to this section. While it can be inferred that e-government is also expected to connect citizens and government entities in addition to provide services, the extent and impact of this two-way and multiple interaction between all e-government domains especially from employee perspective is yet to be researched. This gap indicates the major and potential contribution of this study to knowledge.

Employees are crucial to the success of e-government of any type as they are central to improving processes. Beyond the work done by Fang (2002) and Heeks (2008) in identifying this e-government type, no other research is found that further investigated the factors that influence e-government adoption by government officials. As emphasised by Heeks (2008), services within G2E include the features of G2C services as well as specialized services that are cover by only government employees, such as the provision of human resource training and development that improve day-to-day functions and work processes of employees.

Thus, such extended explanation of e-government concepts, domains and types indicate that e-government is a well-defined and matured field. The introduction to e-government also indicate that the level of maturity of e-government may vary from

country to country and sector to sector. While the extent or level of maturity may provide indication to level of usage and initiatives available to the public, it is important to identify and reinforce factors that may influence usage and continued growth of e-government in countries that have embraced it. The next section focuses on e-government maturity which critically examines the stages of e-government to better highlight potential areas where different factors may influence the adoption of e-government within the public sector.

2.3 E-Government Maturity

The use of the term maturity in e-government is to characterize the level of implementation and the complexity of an e-government process (Andersen & Henriksen, 2006). The main benefit of maturity models is to offer a way to rank e-government portals. Maturity models can also serve as a guide to improve existing e-government services (Fath-Allah et al., 2014). Layne and Lee (2001) suggested that e-government is an evolutionary phenomenon and they developed a comprehensive 4-stage model following the study of various government websites and e-government initiatives to capture these stages.

The proposed model depicts the multi-perspective transformation that may occur within government structures and functions as they transition to e-government (Layne & Lee, 2001). The four stages of growth of e-government presented in the model are (1) cataloguing, (2) transaction (3) vertical integration, and (4) horizontal integration as shown in Figure 2.2.

Figure 2.2 Stages of e-government development (Layne & Lee, 2001)

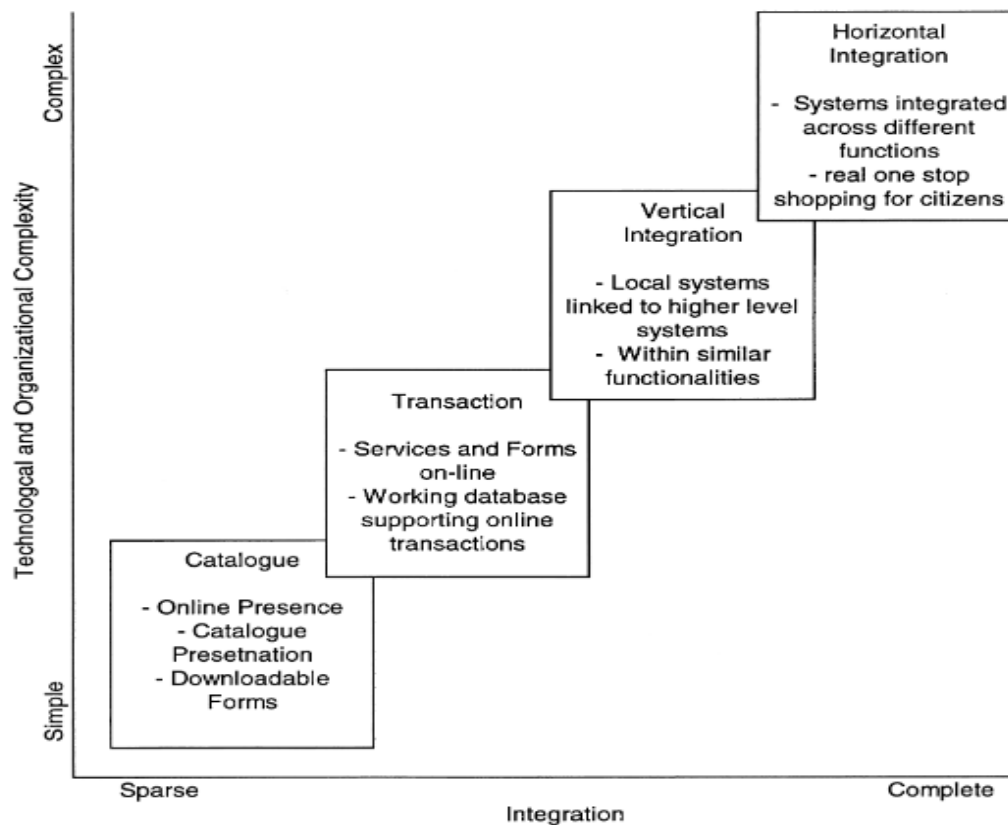


Figure 2.2 shows the interaction between catalogue and transaction, as well as vertical and horizontal integration. Each stage is explained in-depth in section 2.3.1.

2.3.1 Stages of E-Government Maturity

E-government follows a process to attain maturity. As shown in Figure 2.2, integration is attained after transaction but acknowledged that elements of catalogue and transaction stages contribute to make integration possible (Layne & Lee, 2001). For instance, Catalogue is the first stage in the implementation of e-government. Here the initial effort is to establish an on-line presence for the government (Fath-Allah et al., 2014). This includes online forms that can be downloaded on a website with information on government services. This first stage is called ‘cataloguing,’ because efforts are focused on cataloguing government information and presenting it on the web.

Transaction is the second stage where initiatives are undertaken to connect the internal government system to on-line interfaces for electronic transactions are present. There are live databases with links to the on-line interfaces used for payments like license fees or to pay fines on-line with minimal interaction with government staff (Andersen & Henriksen, 2006). At the Integration (vertical & horizontal) stage, the government goes further to link different levels of government and also different functions of government such that a citizen can contact one point of government to complete several levels of governmental transactions—a “one-stop shop” concept (Layne & Lee, 2001).

Thus, integration may happen in two ways: vertical and horizontal. In vertical integration, local, state and federal governments connect to facilitate the same functions or services. In contrast, horizontal integration involves integration across different functions and services (Layne & Lee, 2001). However, critics of the work of Layne and Lee have argued that e-government should also facilitate the participation of citizens in government. A civic dimension called “participation” was therefore added as the 5th stage of the Layne and Lee’s model (Andersen & Henriksen, 2006). Moon (2002) included a civic stage that includes political participation through e-governance, thereby adding political maturity alongside administrative maturity of e-government.

There are other maturity models used to illustrate the phases of e-government implementation (Fath-Allah et al., 2014). Others have further simplified the stages of maturity into three major classifications for e-government dimensions: e-information, e-services, and e-participation (Ingrams, Manoharan, Schmidhuber, & Holzer, 2018; Lee, 2010; Nam, 2014). These stages as explained by these authors suggest that maturity of e-government can be determined or assessed based on the interactions between e-information, e-services and e-participation, and how e-information facilitates e-participation. This explanation portrays e-government maturity as a process, not an end.

2.3.2 Global E-Government Maturity

In a cluster analysis and panel analysis of the Global E-Governance Survey conducted by Ingrams et al. (2018), the maturity of the largest cities in the world's top 100 “most wired” countries from 2003 to 2016 was assessed. The Global E-Governance study is a biennial evaluation of official websites of the largest cities of the 100 “most wired” countries in the world. The survey started in 2003 and there have been seven subsequent surveys, the last covering 2016. The study measured the following variables Content (the level of e-information); Usability (the “user-friendliness” of websites), Privacy and security; Provision of public services to citizens, Citizen, and social engagement (Ingrams et al., 2018). Based on an overall e-government score derived, it is determined that:

- i. Digitally mature cities had high scores for all five categories.
- ii. Digitally moderate cities had lower scores for service and citizen engagement.
- iii. Digitally minimal cities showed lower privacy and security scores.
- iv. Digitally marginal cities suggest low values for all categories, with the exception of usability.

The ranking and score for the top 20 cities in the world based on the five factors assessed are shown in Table 2.2. European cities emerged as the most represented in the top 20 with Helsinki, the capital of Finland is ranked second. Only one US city made the list and that is New York ranked 7th while London was ranked 18th.

Table 2.2: Top 20 Cities in Digital Governance (2016) (Ingrams et al., 2018)

Ran k	City	Total score	Privacy score	Usability score	Content score	Services score	Engagement score
1	Seoul	79.92	13.33	15.94	17.3	16.89	16.46
2	Helsinki	69.84	14.44	17.5	13.17	11.8	12.92
3	Madrid	69.24	12.22	16.56	15.56	13.44	11.46

4	Hong Kong	67.56	12.59	17.81	13.65	14.75	8.75
5	Prague	66.48	14.44	15.31	15.08	11.64	10
6	Tallin	62.1	8.52	17.5	14.13	15.08	6.88
7	New York	62.02	12.59	14.06	15.71	13.61	6.04
8	Bratislava	60.34	11.85	17.19	13.97	7.54	9.79
9	Yerevan	59.61	3.7	17.81	14.92	12.13	11.04
10	Vilnius	59.12	14.44	15.63	12.22	10.16	6.67
11	Buenos Aires	57.88	11.85	16.25	10	10.82	8.96
12	Tokyo	57.04	8.89	18.13	12.54	13.11	4.38
13	Singapore	56.03	9.63	14.38	10.16	13.11	8.75
14	Moscow	54.73	2.59	16.88	13.97	12.13	9.17
15	Oslo	54.37	14.07	10.94	14.44	10.33	4.58
16	Amsterdam	54.36	10.37	14.38	12.86	11.97	4.79
17	Auckland	54.27	8.89	14.06	12.22	11.8	7.29
18	London	52.54	12.22	15	10	11.15	4.17
19	Lisbon	51.68	9.26	12.5	11.9	8.85	9.17
20	Sydney	50.08	8.15	15.94	10.16	10	5.83

Table 2.2 shows that Asian Cities are also well represented with Seoul emerging as the number one globally.

2.3.3 E-Government Maturity in the UAE

The Telecommunications Regulatory Authority (TRA) launched the UAE digital government maturity model in April 2018 in cooperation with Albany State University, USA, to enhance the UAE's rank in the online service index of the biennial UN E-Government Survey. The project has two parts: Digital Government Readiness Assessment Survey and Digital Government Maturity Framework. It contains: Global digital maturity models; UAE federal and local digital maturity models, and the UAE leadership in smart government. The UAE maturity model is compatible with all local electronic governments. They are classified according to five levels from very low maturity to very high maturity (Hossan & Ryan, 2016). The final results will be used to guide further improvement of digital maturity level for each government entity. In

addition to this, the Smart City Initiative is another commendable project that indicates the level of digital maturity in Dubai.

The current signature e-government project for Dubai is the “Services 1” which is Dubai government’s one-stop shop service centre, which delivers integrated government services as bundles without the need for customers to visit other government service centres (Smart Dubai, 2019). Launched in 2017, the centre utilises artificial intelligence technology, which enables the provision of integrated services from several federal and local government entities. At present, the centre offers three-packaged services:

- 1) Mabrook Ma Dabart – the wedding bundle
- 2) Mabrook Ma Yak – the new born bundle
- 3) Tawtheef- the business bundle (Smart Dubai, 2019).

The Services 1 portal provides a platform for collaboration with the general public, customers, private businesses and governmental partners using state-of-the-art behavioural science and information technology. The Services 1 model aims to achieve the first rank in the world in the area of e-government services by 2020.

2.3.4 E-Government Maturity in Dubai

There are several initiatives and projects in Dubai which allure to maturity of e-government in the city. In October 2013, H. H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai announced a project to transform Dubai into a 'smart city' (Smart Dubai, 2019). The purpose of the project was primarily to provide seamless services to the public. This was to be achieved by inter-connecting the departments and entities of Dubai

Government with each other. People would have access to high-speed wireless internet connections to get government services from their smart devices. The project also aimed to provide customised and enhanced services in the fields of education, healthcare, utilities, environment and vehicular traffic and related areas (Smart Dubai, 2019). The smart city strategy features 6 key pillars and 100 initiatives on transport, communications, infrastructure, electricity, economic services, urban planning. The 6 key pillars are: Transport; Communications; Infrastructure; Electricity; Economic services and Urban planning.

The Dubai Smart City initiative provides free Wi-Fi in public areas. As of May 2015, there are more than 200 free Wi-Fi spots in Dubai including Dubai's beaches and parks (Smart Dubai, 2019). The initiative also includes the Dubai Design District which would be a public place that will be transformed into the smartest spot in the world where Companies can provide smart solutions for customers and facilitate transactions such as licences, visas, customs and other government services. Another feature in the smart city agenda is the 5-D control room which is envisioned to be the world's largest room where oversight will be provided to oversee the government projects and service indicators, roads, weather conditions and emergency situations etc. There will also be electric car charging stations to boost the use of environment-friendly cars. Smart Parking would tell drivers the availability and location of parking spaces. Live traffic updates would help plan daily trips before leaving your home. Smart metres and smart power grid will help customers to monitor their power and water use in real time.

A smart power grid will also allow the sale of unused solar energy. There will be the largest open global laboratory' to promote science for those who wish to conduct research and development. The 'My Window to Dubai' programme would facilitate information sharing of data about government entities, schools, hospitals, roads and

transport, sensor systems, buildings, energy and others (Smart Dubai, 2019). I-Dubai would provide information relating to the services of the municipality. Smart Parks and beaches would provide specific information on weather conditions, sea, temperatures, and safety guidelines (Smart Dubai, 2019).

Other smart projects in Dubai that can attest to e-government maturity in the city are radio frequency identification (RFID), smart Nol card, RTA eWallet and QR codes. The RFID is in use to manage tolls in Dubai since July 2007, while the Smart Nol Card is a unified card to pay for transport services in Dubai launched. September 2013. RTA eWallet was launched by Roads and Transport Authority May 2013 is an eWallet which is an online account through which secure online payment can be made. QR codes help to locate addresses and started operating since April 2011. Launched by Dubai Municipality, it is a 'Digital City' project in which each building in the emirate would be assigned a Quick Response (QR) Code.

The QR code contains all details related to the building and the plot embedded in it. By scanning the codes, users can quickly access the desired eServices of the municipality through their mobile phones (Smart Dubai, 2019). Some projects and initiatives were introduced after the launch of the Smart City initiative. They include Makani, environment-friendly electric bikes, happiness meter, Dubai data initiatives, smart Dubai index, sustainable cities, and Apps to mention a few (Smart Dubai, 2019). These initiatives are briefly explained in Table 2.3.

Table 2.3: Examples of Dubai e-government Maturity (Smart Dubai, 2019)

E-projects / Initiatives	Overview
Makani: (my location)	a Dubai smart addressing system. Under this system, each

system	building would be assigned a unique 10-digit number that can be used to search the location through Google and HERE maps.
Environment-friendly electric bikes	for patrolling: In January 2014, Dubai Police started using Segway-style electric bikes for patrolling to get eco-friendly.
Happiness meter:	this is one of Dubai's first strategic 'smart city' initiatives. The metre represents a measurement of the happiness goal. Through a centralised data dashboard, a map of happiness across the city will allow private sector and government entities that host happiness metre touch points, to rank and report customer experiences including direct and web-based interactions.
The Dubai Data initiative:	led by the Dubai Data Establishment and decreed by the Dubai Data Law of 2015, is the single most comprehensive city-wide data initiative guiding the opening and sharing of city data across the public and private sectors
Smart Dubai Index:	this is a set of indicators that will highlight the achievements of Smart Dubai and illuminate future opportunities. The index wheel is split into six parts following six dimensions of Smart Dubai
Sustainable cities:	The UAE is building several sustainable cities that conserve energy and harness renewable energy using technology and architectural designs.
Apps:	Dubai Government launched apps for smart devices that facilitate quick access to their services and enable quick payments. Through the DubaiNow app, you can pay for Utilities, Transportation, Religion (Islam), Health, Residency, Security and justice, Education or Business. The app provides instant digital access to over 70 government and private sector services all in one place.
Smart Car Rental Service:	the service enables customers, especially public transport users, to rent cars for short periods not exceeding six hours

	via smart apps Udrive (Android/iOS) and Ekar (Android/iOS)
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Most of these initiatives or projects were among the first of its kind in the world to measure customer experiences across an entire city, including the private sector and government entities in parallel (Smart Dubai, 2019). However, the initiatives and projects in Dubai may allude to e-government maturity in UAE, they are mostly for public services and usage, not initiatives used by government departments. Explanations in this section and previous ones, reveal that e-government is an advanced field, with different ways of assessing of determining maturity. Amidst this, it can be inferred that a limitation, deficiency and gap in G2E exists which further justify the need for this study and the potential contribution to knowledge.

Furthermore, the examples and explanations in this section indicate that certain factors may influence the use or adoption of e-government be it projects or initiatives. Thus, the next section critically assesses the factors that influence e-government adoption globally with the intention to determine potential factors that may influence e-government adoption in UAE, especially in Dubai.

2.4 E-Government Adoption and Influencing Factors

The adoption of e-Government is examined in this section. The previous section has established the history and concepts of e-government which is traced to the various definitions used by practitioners and academics to explain e-government concepts. From the various definitions of e-government in literature we can summarise that e-government is about Government agencies engaging with citizens by taking advantage

of the interactive features of the internet to improve service delivery, and in public outreach (West, 2004). The provision of e-services by the government has several benefits to citizens, but these can only be realised if these services are used by the relevant stakeholders.

As countries continue to invest in new e-government services the adoption rate of these services among citizens determines the success or failure of these initiatives (Heeks, 2005). In many countries, there are still delays in the adoption and utilisation of e-government services although there has been increasing willingness to use e-services as internet services became more accessible (AlKhatib, 2019). For example, an Indian study that assessed the intention to adopt an electronic government system called online public grievance redressal system (OPGRS) among 419 respondents from eight selected cities in India reported a mean score of 5.26 with standard deviation of 1.23 based on 7-point Likert scale (Rana & Dwivedi, 2015). This mean score implies only marginal willingness by the respondents to use the system since a score of 5 indicates “somewhat agree”. While this result indicates that certain level of engagement and use of e-government, it also reveals that reluctance to adopt and use electronic government system in developing countries.

Another research that examined the intention of male drivers to use the e-services of the traffic department in Saudi Arabia found a mean score of 3.80 and standard deviation 1.16. Scores ranged from 1 to 5, where 4 = Agree and 5= Strongly Agree (Al-Sobhi et al., 2011). This also implies that on the average respondents were undecided about the use of e-services as score fell below 4. However in a doctorate thesis by Al Mansoori (2017) to determine the intent to use e-Government services and the actual use of various and selected e-services survey by 638 citizens from heterogeneous groups of the Abu Dhabi population reported that 80.9% of the respondents had used e-

Government services. These statistics demonstrate the growth in the e-government adoption and intention to adopt services in the 2010s as ICT and technology became more readily available around the world.

Despite the availability of technology around the world including the UAE, the first rank in world in the e-government development index (EGDI) in 2020 is Denmark, while the UAE is ranked in the 21st position (UN, 2020). Republic of Korea is ranked the first having highest for online services, closely followed by Estonia in second place. UAE is ranked 15th on the list for countries by online services index by 2020 (UN, 2020). In fact, the recently published report by the UN shows that, in general in the gulf countries, the UAE did not improve on its EGDI status since 2018 as shown in Table 2.4.

Table 2.4: e-Government development index (UN, 2020)

Country	Rating Class in 2018	EGDI 2018	Rating Class in 2020	EGDI 2020	Movement between 2018 & 2020
Bahrain	V2	Greater than 0.75	V2	Greater than 0.75	<i>None</i>
Kuwait	H	Between 0.50 and 0.75	V1	Greater than 0.75	High to V. High
Oman	H	Between 0.50 and 0.75	V1	Greater than 0.75	High to V. High
Qatar	HV	Between 0-50 and 0.75	HV	Between 0-50 and 0.75	<i>None</i>
Saudi Arabia	H	Between 0.50 and 0.75	V2	Greater than 0.75	High to V. High
United Arab Emirates	V3	Greater than 0.75	V3	Greater than 0.75	<i>None</i>

EDGI Rating class				breakdown
Low EDGI	L1 L2 L3 LM	High EGDI	H1 H2 H3 HV	
Middle EDGI	M1 M2 M3 MH	Very High EDGI	V1 V2 V3 VH	

While it may be fair to indicate that 2 years (2018 – 2020) is too short to effect significant change in e-government context. It is noticed in Table 2.4 that countries such as Saudi Arabia, Oman and Kuwait made improvements within the 2-year timeframe, with Saudi Arabia making the most progress within two years. The reality of e-government services not translating to development further justifies the reasons for undertaking this study to better understand factors influencing adoption (or not) of e-government in the public sector.

As noticed in literature, just like the UAE, in spite of the increasing access to internet services there continues to be variations across countries in the use of e-government by the citizens and the in the factors associated with the intention to use differ in different countries. Several countries have been researched in this regard. For instance, Kurfalı et al. (2017) examined the underlying factors that influence citizens to use e-government services. Their study indicated that social influence, performance expectancy trust of the internet and facilitating conditions were factors that have positive influence on intention to use e-government services in Turkey (Kurfalı et al. 2017). This indicate that the absence of these factors, especially trust, citizens would not use e-government services.

In the study on government agencies in China, it was found that cloud provider support, environmental stimulus, organizational readiness and cloud trust all play key roles in e-government adoption (Liang et al. 2017). It was also found in studies on other transactions in, and within China that, demographic factor have positive impact and moderates the impact of computer self-efficacy leading to the intention to use e-government services (Mensah, 2019). Though age did not have direct impact on intention to use e-government (Mensah & Mi, 2019), the study in Vietnam reveal that links exists between technology adoption and employee performance (Lu & Nguyen, 2016). Findings in the latter allure to the potential of employee performance influencing e-government adoption.

Though certain similar factors or the other were found in researches conducted in Colombia (Maestre et al., 2018), Indonesia (Fakhruzzaman, 2019), Phillipines (Urbina & Abe, 2017), Nepal (Maharjan, 2019) and Mongolia (Shagdarjav & Hwang, 2019), it is noticed that all these studies focused largely on G2C rather than G2G. While it may be argued that the focus on G2C is rational in these countries being emerging economies, similar patterns and gaps in literature were discovered when reviewing developed countries. For instance, the study on UK e-government services identified factors such as information quality, trust, system quality and cost as having the strongest influence on e-government adoption (Weerakkody et al., 2016). The studies on South Korea by Meacham et al., (2019), on Portugal by Naranjo-Zolotov et al. (2019) and on Spain and the United States (Information Resources Management Association, 2018) etc. all focused on G2C and not on G2G. The pattern is mirrored across different regions around the world; across African (Yavwa & Twinomurinzi, 2018; Lallmahomed et al., 2017; Mpinganjira, 2015; Verkijika & De Wet, 2018), in Asia (Singh, 2015; AlKhatib, 2019) and in a study of 55 countries (Zhao et al., 2014).

Though different adoption levels and differing factors were found in all these studies, they all focused on G2C e-government adoption context.

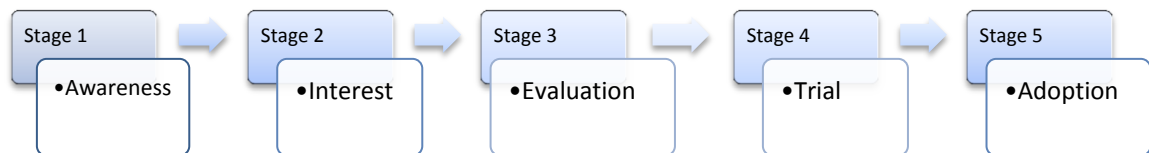
Regardless, these adoption studies are an indication of the culture or country-specific nature of e-government services and the factors determining its adoption. Government services provide information, e-government, therefore, use information technologies in public administration to streamline and integrate information (West, 2004; AlKhatib, 2019). It is further determined that data is managed and integrated to achieve greater efficiency in their processes in order to provide better access to government services, enhanced service levels, greater transparency and citizen empowerment (West, 2004; Lallmahomed et al., 2017). It is noticed that the rationale and intention for e-government adoption in countries examined by these authors have added new dimensions such as citizen empowerment, transparency and better access to government services. These are in addition to the fundamental principles and concept of e-government examined in previous section.

Therefore, as interest in e-Government grows, governments must continuously grapple with how to get stakeholders to engage with e-services to genuinely demonstrate transparency and accessibility to government services. In many countries, public policies have been formulated to enable e-government adoption and implementation in order to advance national development agendas (Al-Sobhi et al., 2011; Malanga, 2016; Manoharan & Ingrams, 2018; Mensah, 2019). This does not automatically lead to the use of e-services by stakeholders.

Authors have demonstrated that the decision to use a new service depends on a mental process that occurs from the time potential users become aware of the service to when they decide to use it (Kotler & Armstrong, 2003). This process occurs in stages.

According to Kotler and Armstrong (2003) in their bestselling book on the principles of marketing, there are five separate stages before a potential user concludes on adopting a new technology. These stages are awareness, interest, evaluation, trial and adoption as illustrated in Figure 2.3.

Figure 2.3: Stages of new technology adoption (adapted from Kotler & Armstrong, 2003)



As stated by Kotler and Armstrong (2003) in their work, a new mode of public service delivery requires awareness, interest, evaluation, trial and adoption and in simple terms implies; **Awareness** is the individual becomes aware of the new product/service but lacks information about it. **Interest**: additional information about the new product/service is obtained. **Evaluation**: the pros and cons of trying out the new product/service is determined. **Trial**: a test or trial of the new product/service is done to assess its value. **Adoption**: decision is made to make full and regular use of the new product/service. Different types of e-government have also been researched since the inception of e-government (Kotler & Armstrong, 2003). These stages are also similar to the attributes of technology adoption explained by Rogers (1995). The next section

briefly explores these attributes in order to assess factors that influence e-government adoption globally.

2.4.1 Attributes of Technology Adoption

Technology attributes have been assessed by several studies on technology adoption. Van Dolen, Dabholkar and De Ruyter (2007) studied the influence of technology attributes on satisfaction with online commercial group chat. Other authors like Wen-Chin (2006) investigate the causal relationship between technology attributes and process performance in the manufacturing sector, while Martins, Steil and Todesco (2004) explore the influence of technology attributes on the adoption of the internet as a teaching tool at foreign language schools. According to Oliveira and Martins (2011) attributes such as compatibility, complexity, and relative advantage are some of the attributes found to play a significant role in several IT-related adoption studies.

Rogers (1995) states that the perceived attributes of a technology, which consists of relative advantage, compatibility, complexity, trialability and observability, explained up to 87 percent of the variance in rate of adoption. The five attributes of innovation or technology adoption by Rogers (1995) are believed to be most suitable, as a variety of technology adoption and diffusion studies have shown that they consistently influence adoption. Studies by Van Dolen et al.(2007); Wen-Chin (2006); Gebauer, Beam and Segev (1998), Ritu and Jayesh (1997) Chan et al (2010), Lin (2011), Zhang et al. (2017) are some of the studies identified.

In their studies, the first attribute which is relative advantage is considered as the degree to which an innovation or technology is perceived as being better than the idea prior to it. Its benefits are often considered in terms of economic profitability, social prestige,

immediate rewards, time and efforts saving (Rogers 1995). However, Choudhury and Karahanna (2008) conceptualised relative advantage as a multidimensional construct that exhibit through three dimensions; convenience; trust; and efficacy of information acquisition. As indicated by Chan et al. (2010), it implies that adoption of any technology needs to be beneficial (financial and non-financial), convenient, trustworthy and efficacious.

Compatibility which is the second attribute refers to the degree to which an innovation is perceived as consistent with existing socio-cultural values, past experiences and the needs of target users (Rogers 1995). Chan et al (2010) identifies two aspects of compatibility: technological and organizational compatibility. Technological compatibility refers to the ability of proposed system to generate effective communication and information sharing with existing technologies in the organization (Chan et al. 2010). Organizational compatibility can be explained as the organizational fit of the system required proposed to facilitate effective information sharing among different departments (Oliveira and Martins, 2011).

Karahanna, Agarwal and Angst (2006) identify a more comprehensive conceptual definition that classified compatibility into four constructs: compatibility with preferred work style; compatibility with existing work practices; compatibility with prior experience; and, compatibility with values. However, in this study, compatibility is referred to as both technological and organizational compatibility as mentioned by Chan et al (2010). The four constructs introduced by Karahanna, Agarwal and Angst (2006) is understood and explained as organizational compatibility rather than as a standalone construct. Rogers suggests that the compatibility of technology is often perceived as positively related to its adoption. This is further proved by Cooper and Zmud (1990), Lin (2011), Zhang et al. (2017) where they all found that technology or

certain innovation is perceived to have both technological and organizational compatibility prior to adoption.

Being the third attribute, complexity is considered as the degree to which an innovation is perceived as relatively difficult to understand and use (Rogers 1995). While some technological innovations are clear in their meaning to potential adopters, others are not. Rogers and other authors however discovered that any technology considered as complex are using not adopted (Cooper & Zmud 1990; Al-Gahtani 2003; Batz, Janssen & Peters 2003; Rogers, 1995; Chan et al. 2010; Lin, 2011; Zhang et al. 2017). The fourth technology attribute is trialability. It refers to the degree in which an innovation may be experimented prior to full adoption. New ideas that can be tried are generally adopted more rapidly than abstract concepts (Rogers 1995). In this sense, trialability is a means to dispel uncertainty about the new idea. Rogers (1995) also suggested that the trialability of an innovation as perceived by members of a social system is positively related to its rate of adoption.

Lastly, Observability is the degree to which the results of technology are visible, easily observed and communicated to others. The results of some ideas are easily observed and communicated to others, whereas some innovations are difficult to observe or describe to others (Rogers 1995). The observability of an innovation as perceived by members of a social system is positively related to its rate of adoption. Rogers (1995) stressed that greater relative advantage, compatibility, trialability and observability, combined with less complexity, will more likely promote the rapid adoption of a technology. Subsequent studies that followed also identify the same causal relationship of these five factors with adoption.

2.4.2 Factors influence E-Government Adoption

The work of Rogers (1995) and Kotler and Armstrong (2003) have alluded to factors that influence technology adoption. Whether is it the five attributes; relative advantage, compatibility, complexity, trialability and observability or five stages; awareness, interest, evaluation, trial and adoption, it is evident from literature that supports the explanation of e-government adoption. For instance, Rehman, Esichaikul and Kamal (2012) explain that their study provided that awareness influences intention of citizens to use e-government services in Pakistan.

Either to gather information or to perform transaction on the government website, the perceived ease of use, service quality and transaction security are significant variables which influence the citizens' intention to perform transactions with the government (Rehman et al. 2012). As noticed, factors from Rogers (1995) ease of use and that of Kotler and Armstrong (2003) awareness are significant variables that influences e-government adoption by citizen.

Similarly, Huang, D'Ambra and Bhalla (2002) identified key factors influencing e-government adoption in Australian public sectors. In this study, interviewees in four organizations identified Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), accessibility and fast and easy to access as key factors that influence e-government adoption in Australia. They also identified facilitating conditions such as support, availability of helpdesk and service response as conditions that encourage use of government services especially the websites and return to use them (Huang et al. 2002).

Though a small scale of study, the study by Huang et al. (2002) provides insight into how e-government adoption in the public sector can be influenced. In this study, factors relating to relative advantage, compatibility, complexity by Rogers (1995) and those of

the five stages; interest, trial and adoption by Kotler and Armstrong (2003). Other studies reveal that e-government adoption is influenced by one technology theory or the other. Lallmahomed et al. (2017) employed the unified theory of acceptance and use of technology and the e-Government adoption model to determine factors that influence the e-government services adoption in Mauritius.

Lallmahomed et al. (2017) further revealed that trustworthiness is inversely related to resistance to change, but awareness campaigns of e-Government services offered with a focus on citizens aged 18–39 years old, it is important to obtain a critical mass of users. They recommended website design and information quality should be improved paying particular attention to security and privacy, thereby increasing trust and reducing resistance to change (Lallmahomed et al. 2017). Factors identified and recommended in their study are also factors by Rogers (1995) and Kotler and Armstrong (2003).

Though most studies adopted technology adoption theories, other variables such as trust, (Alzahrani, Al-Karaghoul & Weerakkody, 2017; Sang, Lee & Lee, 2010; Al Hujran, Aloudat, & Altarawneh (2013) cultural and social influences, technology issues (AlAwadhi & Morris, 2009). All studies on influencing factors tend to investigate citizens adoption of e-government services except Huang et al. (2002). This exposes gaps that exist in this study area and an indication that G2G is perhaps under researched. Studies on factors influencing e-government or e-service adoption in the public sector tend to incorporate theories of technology adoption. Therefore, the next section critically examines theories of adoption with the view to determine the variables that can be tested in the Dubai.

2.5 Theories Of E-Government Adoption

Over the years, e-government adoption research has used different technology adoption theories or models, to study citizens' behaviour in the adoption of e-government around the globe (Fath-Allah et al., 2014). Rahim, Lallmahomed, Ibrahim, and Rahman (2011) described technology acceptance as the study of factors that determine if an individual would accept or reject a technology or service and the factors that would improve an individual's likelihood of technology adoption or the factors that would predict future use of a technology.

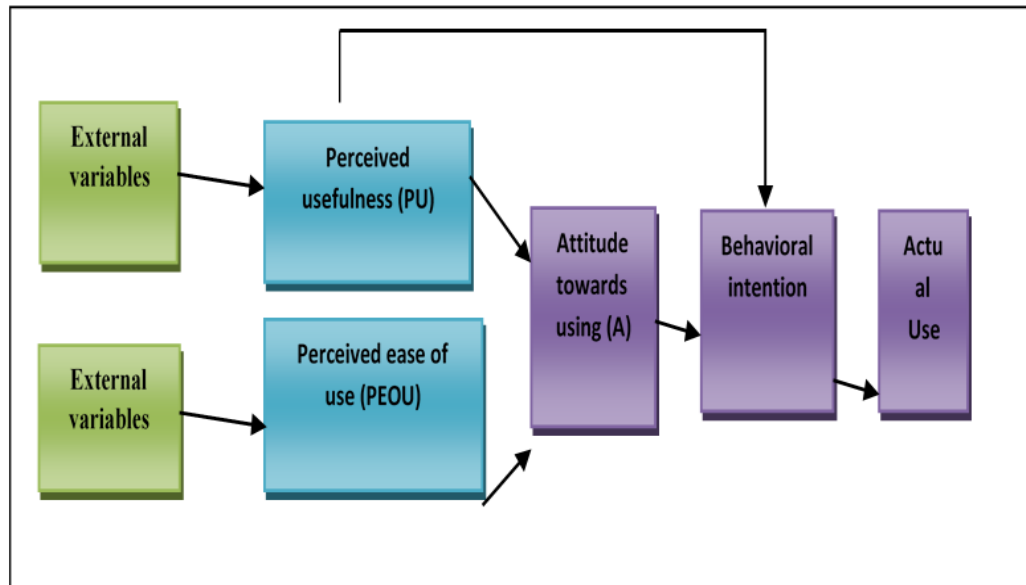
Theories that have been used in studies of the adoption of e-Gov services include; Technology Acceptance Models (TAM) (Davis, 1989); the Theory of Reasoned Action (Douglass, 1977); the Innovation Diffusion Theory (DOI) (Rogers, 2010b); the E-Government adoption model (GAM) (Shareef et al., 2011), the 10-factor model (Hossan & Ryan, 2016) and the Unified Theory of Use and Acceptance of Technology (UTAUT) (Venkatesh et al., 2003). Each theory is briefly explained to better understand the reasons authors adopted them for their studies.

2.5.1 Technology Acceptance Models (TAM)

Technology Acceptance Model (TAM) was introduced by Fred Davis in 1986 as a theory that seek to explain factors that influence ability to accept technology for use in organisations. TAM focuses on explaining how adopting technology is key in predicting and increasing the user acceptance of technology and applications of the same (Al Mutawa, 2013). TAM model can be seen in this sense as a theory that is applied to explain how end-users are able to understand especially their ability to understand, accept or reject the use of new technology. TAM focuses on two major

aspects or characteristics of application; Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as shown in Figure 2.4.

Figure 2.4 TAM model (Adapted from Davies et al. 1999)



The model identified that actual use was dependent on the behavioural intention of an individual which is also influenced by the attitude towards usage. The two different attributes; PU and PEOU are moderated by external factors. The different external variables which are identified in this model could differ in nature. Within this context, PEOU is considered as the degree to which it is believed that using a specific system would be stress and problem-free (Al Mutawa, 2013), while PU explains the degree to which a particular system can be used to enhance performance of a person or individual (Ong et al., 2012). It is implied with TAM context that the primary influence on people or organisation willingness to accept or reject technology system and its application can be traced to external variables and impact of such variables on potential users (Legris & Colletette, 2006; Al Mutawa, 2013).

For instance, the study of users of internet banking as researched by George and Kumar (2013) revealed that from 406 users, constructs such as Perceived Risk (PR) in addition to as PEOU and PU were key variables that influenced the satisfaction of customers in accepting to use internet banking (George & Kumar, 2013). Furthermore, the variation in level of satisfaction was connected to profile of users, indicating that those well-educated, young male employees which had moderately high-level monthly income been keener to use internet banking.

Furthermore, the intentions of citizens in the United Arab Emirates (UAE) resulted in similar outcome when TAM model was used to investigate intention to use internet services. According to the research of Dahi and Ezzaine (2015), PU, PEOU, trust issues, subjective norms and Computer Self-Efficacy (CSE) were related factors that motivated intentions to use e-government services. In this case, a higher sample were used i.e. 845 participants were involved in applying TAM model in order to determine the influence of the five factors (Dahi and Ezziane, 2015).

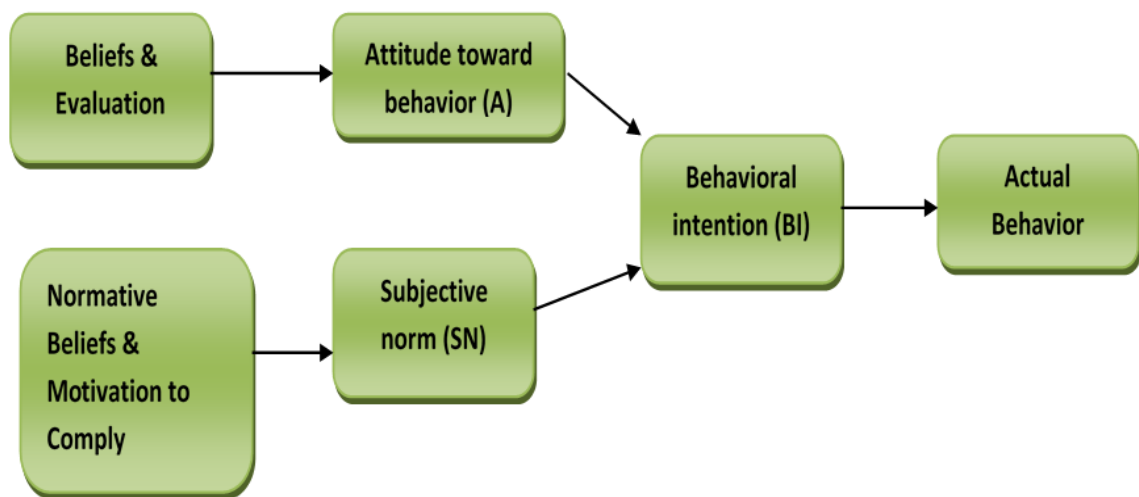
Though these two examples reveal outcomes of examining end-user's intention to use rather than adoption of government employees which is the focus of this study, the examples are used to indicate that application of TAM attributes is not always sufficient to examine a context. Both case studies required the addition of other factors since perception is broadly subjective, therefore insufficient and inappropriate for this study context.

2.5.2 Theory of Reasoned Action (TRA)

In 1980, Ajen and Fishbein proposed behavioural theory which is considered to be relevant to attitudinal behaviour applicable to academic and business research (Ajen & Fishbein, 1980). There are two determinants related to theory of reasoned action (TRA);

intention attitude related to behaviour, and subjective rules associated with behaviour. As indicated by Ajzen and Fishbein (1980), it is a theory developed to understand and determine human behaviour, therefore a generalised research intention theory. The theory of reasoned action has been fundamental to many literatures that are coherent to technology acceptance because of the components of its model shown in Figure 2.5.

Figure 2.5 Theory of Reasoned Action Model (Adapted from Ajzen & Fishbein, 1980)



The model in Figure 2.5 shows that both attitude toward behaviour and subjective norm are influenced by beliefs and evaluation as well as normative beliefs and motivation to comply. These factors further influence both actual and intentional behaviours to use technology. However, this theory is limited in its application because it is based on the rationale that behaviours are under volitional control and any habitual and irrational decisions that is not consciously considered cannot be explained through this theory (Ajzen, 1985; Sheppard *et al.*, 1988). To overcome this limitation of the theory of planned behaviour (TPB) which is an extension to the TRA was developed.

By enhancing the TRA model by Ajzen and Fishbein, it is predicted that intentional behaviour can be generalised rather than subjective. This rationale formed the basis of TPB which is further explained by Chau and Hu in 2002. Chau and Hu (2002) enhanced the TRA framework in relation to belief, attitude and behaviour and intentions to form the TPB model illustrated in Figure 2.6.

Figure 2.6 Theory of Planned Behaviour (Adapted from Chau & Hu, 2002)

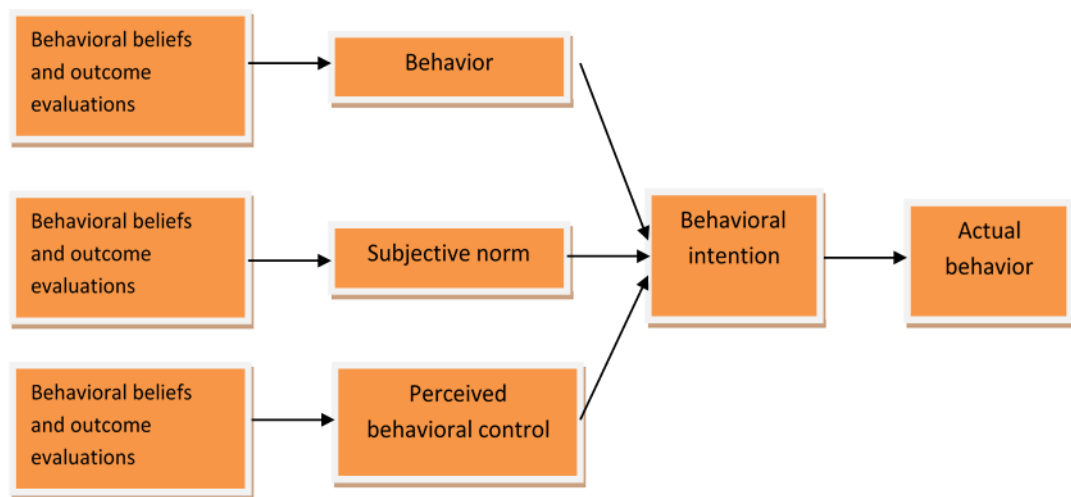


Figure 2.6 is a modified version of the TRA model because it indicates that apart from attitude toward behavior and subjective norm, behavioral intention is influenced by an additional factor such as perceived behavioral control (PBC). The idea of additional factor is considered in selecting a model that best explains this study.

2.5.3 Diffusion of Innovation (DOI) Theory

The Innovation Diffusion Theory or Diffusion of Innovation Theory (DOI) is another commonly adopted theory for technology related research. Like others, it bases its explanation on determinants and behavioural intent or use of technology. Relative advantage, complexity, compatibility, trialability and observability are essential in

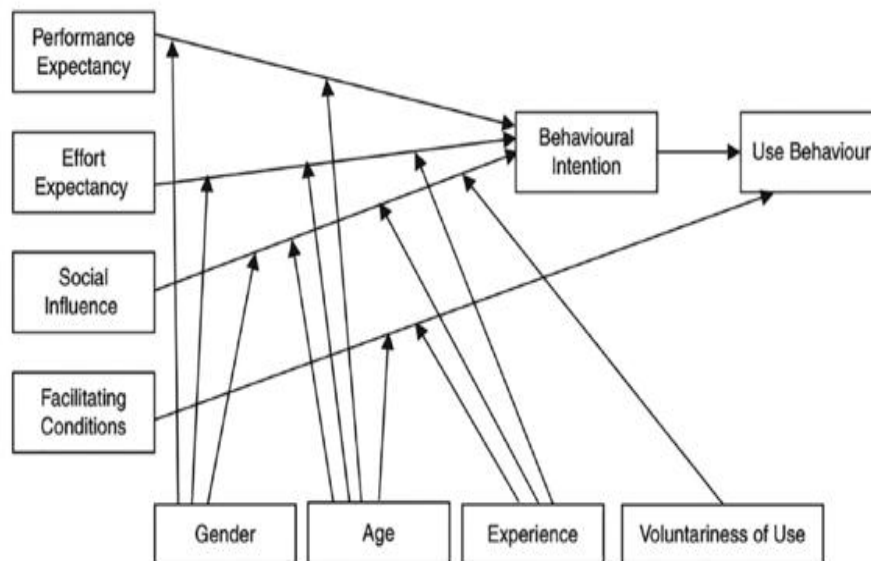
accepting to use technology (Rogers, 2010b). DOI is one of the theories that relate to acceptance and use of technology that has wide reference to behaviour and perception of a technology idea or product (Gayadeen & Phillips, 2014). In this case it relates to the existing perception about technology, and the subsequent behavioural pattern that results from such perception. For instance, Akca and Ozer (2014) explained that variables or factors of DOI such as individual factors, innovative factors, task factors, organisational factors and environmental factors all play significant roles in influencing the adoption and application of technology or resource. Researches in diffusion generally examines the process by which ideas spread among groups of people (Sanderson et al., 2015). It is usually more than just the step flow of theory, but a theory that centres more on the possibility that an idea or innovation will be adopted for use by members of a given organisation or culture (Akca & Ozer, 2014).

Two different research on DOI examined indicate that, while one emphasises the role of five variable factors (Akca & Ozer, 2014), the other stresses the need for explicitness, accumulation and positive influences of technology knowledge in order to influence adoption of technology in organisations. The findings of Al-Zoubi (2013) emphasises deliberate efforts to utilise DOI for technology would increase knowledge and positive influences. On the other hand, authors like Archibald and Clark (2014) applied DOI theory as application that accidentally occurs but which strongly influences behaviour towards technology. The context of this theory makes it too subjective and less focused on factors influencing technology adoption by employee in the public sector. Based on the background to this study provided in chapter 1 and earlier in this chapter, the idea of e-government tends to be accepted in the UAE already, however factors influencing its usage within the public sector departments in Dubai remains unknown. This makes this theory incompatible to this study.

2.5.4 Unified Theory of Use and Acceptance of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) will be used as the theoretical foundation for this study. The UTAUT is one of the latest theories in technology acceptance and it has been shown to explain up to 53% of the variance in the acceptance and intention to use technology-related applications. The UTAUT is often used to explain the intention to use ICT or to determine usage behaviour. Venkatesh et al. (2003) synthesized eight previous technology adoption models with the aim of providing a more complete picture of the acceptance process. The UTAUT is presented in Figure 2.7.

Figure 2.7: The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)



Though the diagram looks complicated it is a flexible model that have been widely used in different e-service adoption context. The UTAUT merges the theory of reasoned action; technology acceptance model; the motivational model; theory of planned

behaviour; technology acceptance model, the theory of planned behaviour; the model of PC utilization; the innovation diffusion theory, and the social cognitive theory.

The UTAUT consists of four predictors; performance expectancy, effort expectancy, social influence and facilitating conditions. Effort expectancy which is explained as the degree of ease associated with consumers use of technology is an important predictor for technology acceptance model. However, social influence is often subjective as it relates to the extent to which consumers perceive technology (Venkatesh et al. 2012). In this sense, it is important for people to believe they should use a particular technology before accepting to do so. Both effort expectancy and social influence are often interchangeably used to explain adoption of technology in studies since people may accept technology is important, but fail to use it if they believe it difficult to use.

However, performance expectancy and facilitating conditions are stronger predictors that can be objectively assessed in organisational context since they are more internal to the organisation, rather than internal or emotional factors personal to individuals. According to Venkatesh et al. 2012), performance expectancy and facilitating conditions can be explained as:

- i) **Performance expectancy:** the degree to which using technology will provide benefits to consumers or people when performing certain activities either for organisational tasks or for regular activities.
- ii) **Facilitating Conditions:** the consumers' perceptions of the resources and support available to users to perform a task or behaviour (Venkatesh et al., 2012: 159).

These two predictors are crucial to this study because they apply to both employees and customers, providing a link between the domains of e-government explained in section 2.3.2 in this chapter. The other predictors; social influence and effort expectancy are

subjective and more focused on explaining two outcomes; Behavioural Intention and Use behaviour. This study is about behaviours in a wider organisational context to identify factors that influence the adoption of e-government especially in public sector departments already using e-government. This focus is based on the understanding that behaviours cannot be simulated to force others to comply. The performance expectancy mentioned in UTAUT (which is also highlighted for use in this study) is also similar to the perceived usefulness in TAM (Davis, 1989). In addition to the UTAUT, another potentially applicable model exists called the 10 Factor Model explained in the next section.

2.5.5 The 10 Factor Model

A new comprehensive model of eService utilisation in a voluntary environment was proposed by Hossan and Ryan (2016). This model is based on an empirical examination of the factors influencing eService adoption in a public sector work environment which were derived from the Theory of Interpersonal Behaviour -TIB (Triandis, 1977). This model outperformed the UTAT by accounting for 79% of the variance in voluntary e-service utilisation (Hossan & Ryan, 2016) compared to the 53% reported for UTAT (Venkatesh et al., 2003). The 10-factor model evaluated the relationship between Organisational Conditions, Individual Attitudes and Beliefs and E-Service Utilisation. The conclusion was that Organisational Conditions did not influence on E-Service Utilisation but rather indirectly increased E-Service Utilisation through the impact on Individual Attitudes and Beliefs.

Individual Attitudes and Beliefs towards introduction of E-Services was a higher-order latent construct for which Impact on Job (perceived consequences) ($\Lambda = 0.674$), Attitude towards e-Services ($\Lambda = 0.716$) and Role Clarity ($\Lambda = 0.70$), were strong predictors

Attitudes towards e-Services (H5) was found to be the most significant predictor. Organisational Conditions was the second higher-order latent construct with Organisational Support ($\Lambda = 0.716$), Leadership Support ($\Lambda = 0.716$), Training Support ($\Lambda = 0.681$), and Organisational Preparedness ($\Lambda = 0.562$) as significant predictors.

In the case of E-Service Utilisation, Impact on Client ($\Lambda = 0.528$), End-user value ($\Lambda = 0.551$) and Usage of Websites for Decision-making ($\Lambda = 0.677$) were the strong predictors for this higher-order latent construct. As an advancement of both the TRA and TPB the TIB argues that factors that influence actual behaviour, are what people have usually done (habits), their behavioural intentions, and facilitating conditions in the environment (Triandis, 1977). The 10-factor model like the TIB is best suited for situations where behavioural intention controls the actual behaviour, when habits are likely to be controlled by behavioural intent (Triandis, 1977).

The 10 Factor Model explains the interactions between organisational, lead and training support as well as organisational preparedness all need to be organised and used by individuals or utilised for client impact, end users and decision. It is important to consider these factors when examining factors that influence e-government adoption when not coerced into adopting any technology. The next section further compares and analyses the theories examined to better understand how the constructs may fit into the current study.

2.5.6 Comparison of Theories

With the exception of the 10-factor model, the four major theories examined in this section have been widely used by several researchers over the past three decades as technology adoption theories (Rodrigues et al., 2016). Their influence on past research and limitations are further examined in this section to justify the theory selected as most

appropriate for this study. For instance, all of these theories are based on the assumption that any potential user of a technology first considers several factors before using the technology, and then decides to adopt or reject the preferred product or service (Al-Jabri & Roztocki, 2015). This indicates that the adoption including usage intention of technology is very much an individual choice. It is however noticed that the factors identified as significant predictors of usage behaviour varied considerably across the spectrum differ. A comparison of the factors identified as determinants of technology acceptance or adoption including those theories already examined and other less popular theories is presented in Table 2.5.

Table 2.5 Theories used in e-government adoption studies

Theories	Author	Determinants of Behavioural Intent/Use
Diffusion of Innovation Theory (DOI)	Rogers, 2010	Relative advantage Complexity Compatibility Triability (tried and has been found to be beneficial) Observability (results visible to others)
Theory of Reasoned Action (TRA)	Ajzen & Fishbein, 1980	Attitude towards an act or behaviour Subjective norm (others opinion about the behaviour)
The Technology Acceptance Model (TAM)	Davis, 1989	Perceived usefulness Perceived ease of use
Theory of Planned Behaviour (TPB)	Chau & Hu, 2002	Attitude towards an act or behaviour Subjective norm Perceived behavioural control
Model of PC	Thompson,	Social Factors

Utilization	Higgins, & Howell, 1991	Long-term consequences Affect towards PC use Complexity Job-fit Facilitating conditions
Motivational Mode	Davis et al., 1992	Extrinsic Motivation (perceived benefits in achieving valued outcomes) Intrinsic motivation
Social Cognitive Theory	Bandura, 1986	Outcome Expectations Performance: performance consequences of the behaviour Outcome Expectations Personal: personal consequences of the behaviour Self-efficacy: perceived ability to use a technology Affect: An individual's liking for a particular behaviour Anxiety: emotional reactions evoked in performing behaviour
Unified Theory of Acceptance and Use of Technology	Venkatesh et al., 2003	Performance Expectancy Effort Expectancy Social Influence Facilitating Conditions
10-factor Model of E-service utilization	(Hossan & Ryan, 2016)	- Individual Attitudes and Beliefs (Job Impact, Attitude towards e-Services and Role Clarity) - Organisational Conditions (Organisational Support, Leadership Support, Training Support and Organisational Preparedness). - E-Service Utilisation (Impact on Client, End-user value and Usage of Websites for Decision-making).

Many research studies have investigated e-Government adoption using the factors identified in one or more of the models in Table 2.5. While some researchers applied the full models, others have used one or more of the constructs or created extensions (Rana et al., 2015). In evaluating all of the models, the central ideas all revolve around the individual's choice and the identified determinants of the intent to use or the actual use of ICT based on personal behavioural antecedents.

These models also tend to focus on citizen adoption or use of e-services because citizens are the prime consumers of e-government services (Rana et al., 2015; Rana & Dwivedi, 2015). Yet the factors impacting e-government from the G2E dimension involves much more than individual levels factors. The role of social, technical, economic, political, and administrative factors in the organisations are also important (Ebrahim & Irani, 2005). In exploring the G2E dimension of e-government, while there are several apparent benefits in adopting e-government in these public sector organisations, the role of organisational factors has yet to be fully explored in extant literature particularly in the UAE context.

The decision to use the UTAUT as the theoretical basis for this study is due to the fact that it has been extensively tested and empirically validated in the field of e-government. For example, Rodrigues, Sarabdeen, and Balasubramanian (2016) used it to examine the determinants of e-government services utilisation in the UAE and found that confidentiality and trust, facilitating conditions, attitude toward technology use, performance expectancy, and effort expectancy were the predictors of user satisfaction and behavioural intention to use e-government services.

In Mauritius, Lallmahomed, Lallmahomed, and Lallmahomed (2017) reported that performance expectancy, facilitating conditions, and perceived value were the

antecedents of the intention to use e-government services. Likewise, a study in Vietnam found performance expectancy, effort expectancy, and social influence were the significant factors in the intention to use and the actual use of e-government services (Thao, 2017). The UTAUT has also been used in Saudi (Al-Sobhi et al., 2011). Rana et al.'s (2013) meta-analysis of the UTAUT model shows that performance expectancy, effort expectancy and social influence are significantly related to behavioural intention.

The UTAUT integrates the fragmented theory and research on individual acceptance of IT into a unified theoretical model that captures the essential elements of eight established models: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planning Behaviour (TPB), C-TAM-TPB, Motivational Model (MM), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT) and SCT (Al Mutawa, 2013). According to Al Mutawa (2013), the UTAUT is able to account for 70% of the variance in the usage intention- a considerable improvement over all of the models, thus further justifying why UTAUT is selected for this study.

2.6 Evaluation of UAE e-Government adoption

It other to justify the appropriate constructs for the UAE context, it is important to critically review the trend and nature of e-government adoption in the gulf region. As a starting point, Al-Shboul, Rababah, Al-Shboul, Ghnemat, and Al-Saqqa, (2014) examine and identify the factors that influence the utilization of e-Government in developing countries, specifically in Jordan. In their study, they identified budgeting and financial costs, human expertise, social influence, resistance of public employees, trust or belief in e-Government, technological issues and lack of awareness as the major factors that influence the utilization of e-government.

Though there were organisational factors identified by Al-Shboul et al. (2014) in Jordan, Sharma (2015) indicate that relationship exists between service quality dimensions and demographic variables, and the willingness to use e-government services in Oman. The difference between these two countries is that while factors in Jordan tend to be both organizational and non-organisational factors, that of Oman tend to be more demographics and internal factors. In Oman, Sharma (2015) reveal that demographic factors such as age and education level play a major role in adopting e-government services in the country.

Reference is made to UTAUT in the gulf region especially in adopting e-government services in Jordan. Though a modified version, Rabaa'i (2017) used performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention were significant factors in the adoption of e-government services. This infers that it is possible that these factors are also applicable in UAE. Other studies in the Gulf include that of AL-Mutairi, Naser and Fayez (2018) who assessed e-government in Kuwait and possible obstacles to effective e-government.

Al-Refaie and Ramadna, (2020) examined the effects of five types of barriers; technology, organization, strategy, policy, and end-user barriers, and investigates their effects on E-government adoption in Jordan. Al-Sobhi et al., (2011) provided a better understanding of citizens' adoption of e-government services using the (UTAUT) in the context of Madinah city in Saudi Arabia. These studies, objectives and key findings are further outlined in Table 2.6.

Table 2.6 E-Government Adoption and Factors in Gulf Countries

Author	Objectives	Key Findings
Al-Shboul, Rababah, Al-Shboul, Ghnemat, & Al-Saqqa (2014)	To examine and identify the factors that influence and affect the utilization of e-Government in developing countries, specifically in Jordan.	Budgeting and financial costs, human expertise, social influence, technological issues, lack of awareness, resistance of public employees, data privacy and security, the legal framework, the needed technology, administrative obstacles, and trust or belief in e-Government.
Sharma (2015)	Understanding the relationship between service quality dimensions and demographic variables, and the willingness to use e-government services in Oman	Service quality dimensions: reliability, security, efficiency, and responsiveness, were the key determinants of the willingness to use e-government services. Age and education level of respondents was also significant in the willingness to use e-government services
Rabaa'i (2017)	A modified version of the unified theory of acceptance and use of technology (UTAUT) was used to examine factors that determined the adoption of e-government services in Jordan.	Performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention were significant factors in the adoption of e-government services.
AL-Mutairi, Naser, & Fayez (2018)	Assessment of e-government in Kuwait and possible obstacles to effective e-government.	Limited IT infrastructure, low or average level of knowledge and experience in information technology by citizens, poor data security to protect public data and information.

Al-Refaie & Ramadna (2020)	Examined the effects of five types of barriers; technology, organization, strategy, policy, and end-user barriers, and investigates their effects on E-government adoption in Jordan	The technology barriers were the main obstacle to successful E-government adoption in all organizations. Moreover, the effects of the other four barriers varied among organizations
Al-Sobhi et al., (2011)	This study aims to provide a better understanding of citizens' adoption of e-government services using the (UTAUT) to examine the influence of intermediaries on citizens' adoption of e-government services in the context of Madinah city in Saudi Arabia.	Efforts expectancy, the trust of the Internet and trust of intermediary organisations impacted e-government adoption behaviour. Facilitating conditions provided by intermediary organisations had a significant impact on the usage of e-government services.

More similar theories like UTAUT model is also used to explain adoption of technology especially e-government in the UAE. For instance, Rodrigues et al., (2016) identify confidentiality, trust and attitudes toward technology as the key determinants of overall satisfaction and adoption of e-government services. They used UTAUT model to generate this finding. Dahi and Ezziane, (2015) also identified factors associated with the intention of citizens to use e-government services in the Emirate of Abu Dhabi in the UAE using modified TAM. However, none of these studies identified combination of factors examined in this study.

From studies by Dahi and Ezziane (2015), Al Athmay (2015), Rodrigues et al. (2016), Almuraqab (2017) and Jasimuddin, Mishra, and Saif Almuraqab (2017), which used different theories, it can be inferred that there is no dearth of studies on e-government adoption in the UAE. Though different factors based on the various objectives were examined by these authors, these earlier studies provided context for e-government

adoption in the UAE and types of factors that potentially impact e-government adoption in the UAE government. These studies e-government adoption in the UAE and their respective objectives are presented in Table 2.7.

Table 2.7 E-Government Adoption and Factors in UAE

Author	Objectives	Key Findings
UAE		
Rodrigues et al., (2016)	To identify the factors important to the users - of e-government services using UTAUT model	Confidentiality, Trust and Attitudes toward technology were the key determinants of overall satisfaction and adoption of e-government services
Dahi & Ezziane (2015)	Determine factors associated with the intention of citizens to use e-government services in the Emirate of Abu Dhabi in the United Arab Emirates (UAE) using modified TAM	Website quality, facilitating conditions, awareness in addition to perceived usefulness (PU), perceived ease of use (PEOU), subjective norms, and trust – significantly influenced citizens' intentions to use e-government
Jasimuddin, Mishra, & Saif Almuraqab (2017)	To explore the factors that influence e-government services adoption in the UAE using the PLS-SEM approach	Social influence, perceived ease to use, perceived trust in technology were the important determinants of the intention to use digital technology
Al Athmay (2015)	To measure the impact of demographic factors as determinants of citizens' perceptions toward e-openness and e-participation.	Gender, age, education, and type of employment explained differences among the respondents.
Almuraqab (2017)	To identify the factors influencing the intention of citizens to use mGov in the UAE. Used a structural model based on technology acceptance model (TAM), diffusion of innovation (DOI) and trust model	Four constructs had a direct effect on citizens' intention to use mGovernment services: perceived compatibility (PC), perceived ease of use (PEOU), social influence (SI), and trust in technology (TIT). The most influential construct toward ITU is perceived compatibility (PC),

In relation to the development and deployment of e-government in UAE studies in the region reveal that it has been mainly driven by ICT and e-government plans by federal government but services are mostly implemented at the local Emirate level. Without an understanding of how and why employees use electronic service delivery channels over more traditional service delivery methods, government organizations cannot take the necessary strategic actions to meet their citizen adoption targets for these channels.

Therefore, with background to e-government adoption established in the Gulf region and the UAE, it is deduced that e-government research exists in the region. Furthermore, it can be established that adoption of e-government is justified by applying elements of UTAUT model as well as 8 factors from the 10-factor model to make this study unique in relation to G2E. Therefore, the UTAUT and 8-factors are adopted for this study. The next section is the research hypotheses justification and development of the research framework.

2.7 Research Hypotheses and Framework

An investigation of the success factors at different stages of e-government maturity across 100 cities found that all stages had mostly uniform drivers: population size, GDP, and regional competition had a positive association across all stages of maturity. However, the influence of democracy level varied, with an impact in some higher stages in large countries but with a negative association in smaller countries (Ingrams et al., 2018). Environmental and internal capacity factors were significant at all stages of maturity, Institutional factors (competition and learning from other governments in the region) impacted at the E-service level of maturity. The second institutional factor is the governance factors, including democratic level and transparency norms. These

institutional factors have impact at the higher levels of e-government development, e-services, and e-participation.

However, the quality of public servants determines the overall administrative efficiency of public sector services. Employee involvement is therefore critical after electronic service policies are enacted to ensure adequate policy implementation. It is important that barriers and facilitators of frontline workers be identified to ensure effectiveness of the e-services. There are very few studies that have explored the public servant's adoption of e-government. A study to investigate the factors based on the UTAUT model that influences the behavioural intention of public servants regarding their use of e-government learning reported that employees' attitude, policy environment, performance expectancy facilitated adoption (Chung et al., 2016). While the reported lack of learning time; inability to adapt to the learning environment; being unaccustomed to the e-learning methods and frequent interruptions during training were barriers.

In terms of the training content lack of relevance between the courses and the work of the learners, and boring course content were learning obstacles. The study also found that incentives, accountability from senior management facilitated the adoption of e-government. and attitude, obstacles, encouragements, and pressure are closely related to learning. In summary key, influential factors were performance expectancy,” “barrier factor,” “policy factor,” and “behavioural attitude,” influencing the e-learning intention of public servants in China (Chung et al., 2016).

A Systematic Review of the factors Affecting Employees' Adoption of E-government using an Integration of UTAUT and Task-technology fit (TTF) found that only one article in this category of interest but this not related to the employee perspective

(Amrouni et al., 2019). Furthermore, in the study of the barriers to E-government adoption by Ebrahim and Irani (2005) organisational issues were identified as an important factor in the successful deployment and use of e-government services. Thus, alluring to the role of organisational factors in facilitating the adoption of e-government. However, in spite of the robustness of the UTAUT model it is also geared towards the citizen context (Venkatesh et al., 2013). Within the context of the UAE where cost, infrastructure, and IT skills have all been prioritised by the government and the voluntariness component of the UTUAT models is not a major factor since use of e-government services is mandated.

As established earlier in this study, Rodrigues, Sarabdeen and Balasubramanian (2016) indicated in their study that the determinants of e-government services utilisation in the UAE were confidentiality and trust, facilitating conditions, attitude toward technology use. They further revealed that performance expectancy, and effort expectancy were the predictors of user satisfaction and behavioural intention to use e-government services. Therefore, employee willingness is also tested and examined in this study given that the performance expectancy, efforts and social significantly relate to behavioral intention and attitude.

Based on this, facilitating conditions such as organizational factors and employee willingness become priority areas to test and examine in this research based on the explanation of robustness of the UTAUT model revealed by Rodrigues et al., (2016), Dahi and Ezziane, (2015), Rabaa'i (2017), AL-Mutairi, Naser and Fayez, (2018). The UTAUT combines the main features proposed by eight technology acceptance models such as reasoned action theory (Davis et al. 1989), TAM (Davis, 1989), model of motivation (Davis et al. 1992), Planned behavioural theory (Ajzen, 1991), Combination of TAM and TPB (Taylor & Todd, 1995), PC utilization (Thompson et al., 1991),

Diffusion of innovation (Rogers, 1995) and Theory of social cognition (Compeau & Higgins, 1995).

All these authors identified relationships between performance expectancy and adoption of technology in either public or private sector. They found performance expectancy as instrumental to positive perception of technology or e-government by employees. While this indicate that relationship exists between independent and dependent variables when it comes to e-government adoption. This is reinforced in more recent studies by authors such as Hossan and Ryan (2016), Thao (2017), Rehman, Esichaikul and Kamal (2012) as well as Al-Shafi and Weerakkody (2010) identified factors that affect or influence e-government adoption in government sector or government.

All these evidence from recent studies align with, and strongly support that performance expectancy such as short-term performance, long-term performance and client impacts influence the utilisation of e-service or e-government. Based on this, it is proposed that:

H1: a positive relationship exists between performance expectancy and e-government adoption in Dubai government departments.

To effectively test this hypothesis within Dubai government departments, hypothesis 1 is further proposed as:

- H1a: Short-term job performance influences adoption of e-government services.
- H1b: Long-term job performance influences adoption of e-government services.
- H1c: Client impact influences adoption of e-government services.

Lallmahomed et al. (2017), revealed that performance expectancy, facilitating conditions, and perceived value were the antecedents of the intention to use e-

government services. These hypotheses are tested in the UAE to determine which is accepted or rejected. Regarding other factors that influence the adoption of e-government services, Thao (2017) justified through their study that performance expectancy, effort expectancy, and social influence were the significant factors in the intention to use and the actual use of e-government services.

More facilitating conditions have been identified to enable e-government adoption by authors such as Weerakkody et al. (2013), Kurfalı (2017) and Rokhman (2011). Adoption of E-government is researched to be influenced by elements of technology acceptance models, facilitating conditions such as support, training and increased awareness of the benefit of using technology or e-services. This notion supports the next hypothesis which focuses on factors that facilitate e-government usage in the UAE which is under researched, but well founded in the Arab countries. For instance, Alomari et al. (2010) researched social factors that influence e-government adoption in Jordan.

It is noticed from literature that the preparedness and support are important in the use of e-government. Using the UTAUT Al-Sobhi et al. (2011), Rana et al. (2013), Weerakkody et al. (2013), Kurfalı (2017), Thao (2017), Lallmahomed et al. (2017) and Rokhman (2011) all strongly explained that performance expectancy, effort expectancy and social influence are significantly related to behavioural intention to adopt e-government. Given that Hossan and Ryan (2016) in their 10-factor model clearly indicated that Leadership support, Training support and organizational Preparations are organizational conditions that act as facilitating conditions for e-government adoption. Rabaa'i (2017) further explained using a modified version of UTAUT that performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural

intention were significant factors in the adoption of e-government services. Based on these arguments, it is proposed that:

H2: a positive relationship exists between facilitating conditions and e-government adoption in Dubai government departments

Based on the theoretical explanations for H2, the facilitating conditions selected for this study are; leadership support, employee training and organizational preparedness support. Therefore, the following direct hypotheses are derived:

- H2a: Leadership support influences adoption of e-government services.
- H2b: Employee training influences adoption of e-government services.
- H2c: Organizational preparedness support influences adoption of e-government services.

While the facilitating conditions of e-government or e-service adoption is evident in studies, AL-Mutairi, Naser and Fayez, (2018) further revealed that e-government could be hindered and be less effective especially as realised in Kuwait. Al-Refaie and Ramadna, (2020) indicated that employee willingness and belief in the relevance of their role effects E-government adoption in Jordan. Their study indicate that attitude is central to adoption of e-government or e-service of any nature. The attitude of any individual is central to developing the appropriate level of willingness to use technology (Alomari et al. 2012; Al-Hujran et al. 2015; Kurfali et al. 2017). Authors like Ozkan and Kanat (2011) and Ziemba et al. (2013) researched the models for success factors for e-government adoption. They found that there could be potential hinderance to e-government effectiveness, as such willingness to important in overcoming any hinderance to e-government adoption.

Within public sector perspective, Ahmad et al. (2012), Zhang et al. (2014) and Hossan and Ryan (2016) revealed that individual attitudes and beliefs such as attitude and role clarity are important and should be dimensions to measure in relation to employee adoption of e-Services. Though the level of clarity and attitude required for adoption is not revealed in literature, the authors and their work have created a justification for the premise that:

H3: a positive relationship exists between employee willingness and e-government adoption in Dubai public sector departments.

The direct hypotheses from this main hypothesis are:

- H3a: Employee attitudes towards e-government influences adoption of e-government services.
- H3b: Role clarity influences adoption of e-government services.

Lastly, while the role of organizational factors such as leadership support, training support and organizational preparations are the key dimensions to test and examine in this study, it is important to consider the role of other factors such as employee willingness. Though compliance is expected in the UAE public sector, progress of G2E is rather slow.

Venkatesh et al (2012) revealed that there four moderator variables that may influence the adoption of technology. There are; gender, age, experience and voluntariness of use. While both experience and voluntariness of use are personal and subjective, gender and age are demographic information that may be more objectively studied and assessed. According to Nasurdin, Nejati and Mei (2013) gender is a moderator in workplace and organisational behaviour. They revealed that gender moderate organisational dimensions and performance. Venkatesh et al (2012) revealed that moderator variables

may influence the adoption of technology, and in this case, it may be deduced that adoption of G2E in UAE is also influenced by moderator variables such as age and gender.

In studies conducted in the late 2000s, Wegge et al. (2008) argue that both age and gender are determinants of performance in public sector organisation especially in terms of employees carrying out their tasks. Following this, Ali, Kulik and Metz (2011) revealed that gender influences organisational performance. These authors established the link between gender and age, and their potential moderating role in organisations especially public sector organisations. Other authors such as Wang et al. (2013), Kacmar et al. (2011), Shirom et al. (2008) and Zacher and Griffin (2015) all researched on the role of age and or gender as moderator in any organisational related concept.

Though not all within technology adoption, they however create the premise to assume that the context of gender and age are pivotal as a moderator in the adoption of e-government. As observed, both age and gender are selected as predictors for technology adoption as allured to by Venkatesh et al. (2012). Both age and gender are also well researched by other authors as perceived moderators in studies on organisations. Therefore, age and gender are selected as moderators in this study. They are well placed within the UTAUT model being selected to assess e-government adoption in Dubai government departments. To determine the variables that moderate the adoption of G2E in the UAE public sector, it is proposed:

H4: The adoption of e-government services in Dubai public sector departments is moderated by demographic variables.

The moderating hypotheses derived from this assumption are:

- H4a: Employee age moderates the relationships between attitude towards e-government and adoption of e-government services.
- H4b: Employee age moderates the relationships between role clarity and adoption of e-government services.
- H4c: Gender moderates the relationships of employee attitudes towards e-government and adoption of e-government services.
- H4d: Gender moderates the relationships of role clarity and adoption of e-government services.

The direct and moderating hypotheses outlined in this section are applied to design and develop the research framework illustrated in Figure 2.8.

Figure 2.8 Research Conceptual Framework

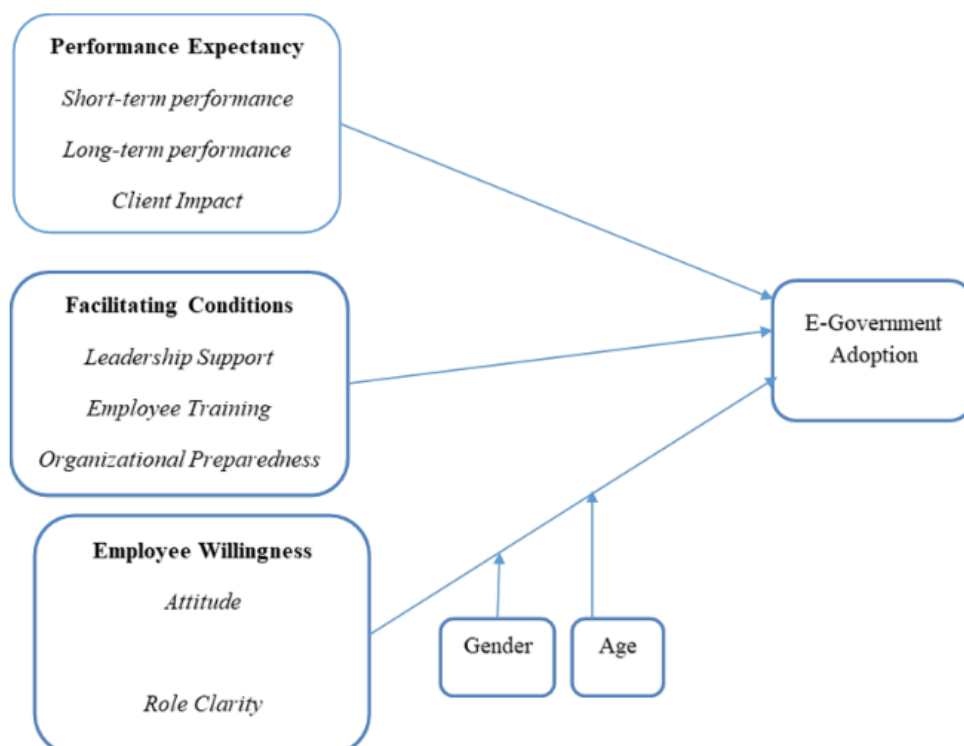


Figure 2.8 shows that the first illustration has a direct arrow between performance expectancy and e-government adoption. This represents hypothesis 1 which consists of three other sub-hypotheses to further test and examine the relationship between each determinants of performance expectancy and e-government adoption in Dubai public sector. Hypothesis 1 is comprehensive because it is important to determine which of the performance expectancy determinants have positive relationship with e-government in the public sector. Through this process, it is likely to determine whether short-term or long-term job performance or client impact influences adoption the most or equally and directly. While performance expectancy is found to have direct and positive influence on intentional to use e-government services (Kurfalı et al. 2017; Fakhruzzaman, 2019; Shagdarjav & Hwang, 2019), they were in G2C context. Since previous related to people, similar assumption is adopted for this hypothesis.

Hypothesis 2 is illustrated next in Figure 2.8 to show that facilitating conditions such as leadership support, employee training and organizational preparedness have direct positive influence on e-government adoption in the public sector. Testing this hypothesis in Dubai context is significant because of the extant of resources committed to e-government services, but which does not translate to advancing the goal of the UAE to be ranked the first in the world in the UN e-government development index. Studies on government agencies have identified organizational readiness, environmental stimulus (Liang et al. 2017) and computer self-efficacy (Mensah, 2019) as facilitating conditions that play key roles in e-government adoption. Other about organizations in general reveal that organizational specific factors matter in the determinant of e-government maturity (Kachwamba, & Hussein, 2009; Sarabdeen et al.

2014). These factors can be classified as organizational factors that facilitate the intentions and conditions to use e-government.

Therefore, it is envisaged that the outcome of this particular hypothesis within the framework would provide insight into why UAE especially Dubai did not improve on its ranking in the world index between 2018 and 2019 while three other gulf countries made progress (UN, 2020). The third direct hypothesis is H3 which has two determinants within it. As the third direct hypothesis, it aims to test the positive relationship (if any) that exists between employee willingness and e-government adoption. Though facilitating conditions play important roles (Liang et al. 2017), employees also need to play their part in using e-government services as acknowledged by Ifinedo (2012). As a result, H3 is equally critical and builds on the findings of H2 in order to help Dubai public sector and UAE improve on current status and achieve the global ranking goal.

Hypothesis 4 focuses on identifying factors that moderates employees' willingness and e-government adoption. The moderating hypotheses are linked with the determinants of employee willingness because this is the variable with determinants associated with people and their ability to make decisions. The argument for moderation is explained through the UTAUT model by Venkatesh et al. (2012), and how demographic variables such as age and gender could potentially moderate the relationship between employee willingness and e-government adoption (Venkatesh et al. 2012). Furthermore, Mensah and Mi (2019) found demographic factors to moderate the relationship between employee willingness determinant such as self-efficiency and e-government service adoption. The fourth hypothesis and its sub-hypotheses are formulated based on the understanding that the relationship between an employee willingness factor and e-

government adoption is moderated by demographic variables. Thus, two upward arrows are drawn to link with the direct arrow between employee willingness and e-government adoption.

The research conceptual framework has illustrated that different factors interact in the adoption of e-government, though their level of influence or type of influence may vary as identified in several literature examined in this chapter. No doubt, the relationships illustrated using the direct and upward arrows are supported in literature. There is however need to test these relationships in the UAE especially Dubai context due to the government's resource commitment to e-government adoption that fails to generate the appropriate level of traction for global recognition.

2.8 Summary of Chapter

This chapter has explained the concepts, theories and factors influencing e-Government adoption globally and in the UAE. It also provides a summary of the evidence on the maturity stages, domains and dimensions of e-government. This chapter also discussed three two constructs of the UTAUT; performance expectancy and facilitating conditions and the influence on these constructs on e-government adoption. An overview of the status of e-government services and the maturity of the UAE and Dubai e-government initiatives is provided to set the context for the research. Literature has also demonstrated a gap in the body of knowledge of public sector employee's perspectives and adoption that of e-government service.

The moderating influence of age and gender in the adoption of e-government has led to its addition to the research model alongside the constructs from the UTAUT model. The

moderators (age and gender) are also selected from the UTAUT model. The 8 factors from the 10-factor model also included the development of the direct hypotheses. The hypotheses for the research are presented alongside the proposed research model which further influenced the research design explained in the methodology chapter. The methodology for this research is explained in the next chapter.

CHAPTER 3: METHODOLOGY

3.1 Introduction

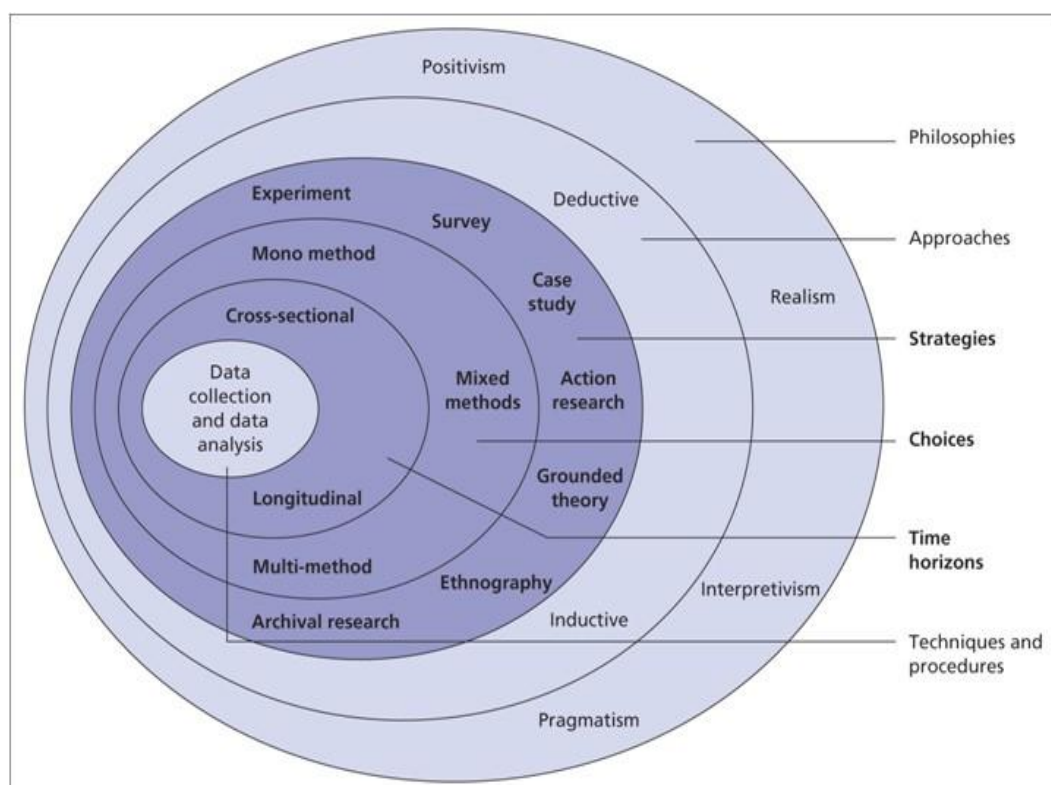
In order to enrich the body of knowledge on the adoption of e-Government in the Dubai Public Sector it is necessary to develop valid, reliable explanations for how this knowledge will be obtained and processed. Chapter 1 has provided details of what is already known about the adoption of e-government, the current gaps in literature and the justification for conducting this research. An introduction to the structure and function of the UAE public sector was also presented. In chapter 2, a critical examination of the current applications of e-Government and how e-government has been adopted in different parts of the world was conducted. The gap in the literature on the factors impacting e-government adoption in the UAE has been identified with the aim to systematically collect information and develop explanations on the organizational factors influencing the adoption of e-government in UAE key public departments.

This chapter provides a detailed information and justification for the methodology used in this study. It discusses the study design and the theoretical approach used to achieve the research objectives. This includes the analyses of the different approaches, philosophies, strategies, and data collection techniques. The chapter begins with a review of the research type and process, presenting the “research onion” as a framework for the contents of other sections which cover the research philosophy, approach, methodological choice, research strategy, and time horizon.

3.2 Research Design and Process

Saunders et al. (2012) created the Research Onion model to explain the different stages in research and to guide the presentation of a better organised methodology. Figure 3.1 below depicts the research onion which symbolically illustrates the ways in which different elements involved in this research would be examined and this informs the final research design in line with the recommendations of Saunders et al. (2012).

Figure 3.1: Research Onion Model (Saunders et al., 2012)



As shown in Figure 3.1, the research onion consists of six main layers, with each layer of the research onion containing multiple options. To establish the methodology for this research in a proper context, the six-layered onion research process was adopted to present the philosophy, approach, methodological choice, strategy, time horizon, and techniques for the research.

3.2.1 Research Philosophy

Philosophy is the first layer in the research methodology framework. This refers to the set of principles concerning the worldview or stance from which the research is conducted. It explains the reasoning, branch of knowledge, and perspective of reality used (Saunders et al., 2012). Research philosophy is usually studied in terms of ontology and epistemology. Ontology refers to the authenticity of the information and how one understands its existence, whereas epistemology refers to the validity of the information required for the research and how one can obtain it (Holden & Lynch, 2004a).

Authors like Collis and Hussey, (2014) and Saunders et al., (2019) explain that whilst several philosophies exist for conducting research, there are two philosophies that are more applicable to research in the social sciences: positivism and interpretivism. These philosophies vary in their assumptions about the nature of reality and are formed from ontological, epistemological, and axiological philosophical assumptions (Collis & Hussey, 2014).

Positivism assumes that knowledge is independent of the subject being studied, and interpretivism claims that individual observers have their own perception and understanding of reality. Hence positivist studies are often regarded as more scientific and result in testing phenomena, whereas interpretivist studies are often qualitative in nature (Holden & Lynch, 2004b). Positivism research uses quantitative methodologies, which are based on measurement and numbers, to collect and analyse data while interpretivists use qualitative data, which are based on words or images (Saunders et al., 2012). Table 3.1 compares the perspectives of positivism and interpretivism.

Table 3.1 Comparison of the perspectives of positivism and interpretivism

Positivism	Interpretivism
Sees society as shaping the individual and individual action.	Believes individuals shape society
More interested in trends and patterns rather than individuals.	Aims to gain in-depth insight and empathetic understanding of individual experiences and actions
Prefer quantitative methods such as social surveys, structured questionnaires, and official statistics.	Uses qualitative methods such as unstructured interviews or participant observation
Uses “scientific” techniques to uncover the laws that govern societies similar to how scientists discovered the laws that govern the physical world.	Believe that different people experience and understand the same ‘objective reality’ in very different ways and have their own unique responses, thus scientific methods are not appropriate
Tend to look for relationships or ‘correlations’ between two or more	Aims to understand human action or behaviour.

variables.

Views knowledge as based on facts, transcending time and cultural location.	Views knowledge as subjective and contingent on time and cultural location and individual interpretation.
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This research is based on the positivist paradigm as it intends to apply scientific techniques to discover patterns of e-government adoption and explore relationships between e-government adoption and identified organisational factors. The research follows the positivist logic of argument with a belief that research hypotheses are testable and amenable to being verified, confirmed, or shown to be false by the empirical observation of reality (Collis & Hussey, 2014).

The research objectives previously identified are more suited to the positivist paradigm which allows for the development and testing of hypotheses (Krauss, 2005). Data will be collected with objectivity to demonstrate causality and to aid hypotheses testing. Quantitative research instruments that have been used globally to detect the same phenomenon will be used. In the positivist paradigm, different researchers are able to conduct the same study in the same way and achieve comparable results (Krauss, 2005).

3.2.2 Research Approach

The research onion identifies three types of approaches to theory development: deductive, abductive, and inductive. However, most authors of business research methodology emphasize two main approaches to gaining new knowledge: inductive and deductive (Saunders et al., 2019). Abductive reasoning relates to a process which starts with an incomplete set of observations and then proceeds to a possible set of

explanations for the observed phenomenon (Saunders et al., 2016). This differs from inductive reasoning which starts with observations of a more specific, limited scope and then proceeds to a generalised conclusion based on accumulated evidence (Saunders et al., 2016; Collis & Hussey, 2014).

The deductive approach develops the hypothesis or hypotheses upon a pre-existing theory and then formulates the research approach to test it (Silverman, 2017). The deductive approach can be considered particularly suited to the positivist approach, which permits the formulation of hypotheses and the statistical testing of expected results to an accepted level of probability (Sileyew, 2019). It is characterized as the development from general to particular: the general theory and knowledge base is first established, and the specific knowledge gained from the research process is then tested against it (Kothari, 2004). Deductive approach uses questionnaire to create understanding of an observation which allows the comparison of different phenomena through empirical data.

The data gathered helps to confirm or reject the research hypothesis (Holden & Lynch, 2004b). On the other hand, the inductive approach helps to create a theory rather than to simply adopt a pre-existing one as done with deductive approach. The inductive approach therefore moves from the specific to the general (Bell et al., 2018). In this approach, there is no framework that initially informs the data collection and the research focus can thus be formed after the data has been collected. This method is commonly used for qualitative research. Interviews are carried out concerning specific phenomena and then the data may be examined for patterns between respondents (Silverman, 2017).

This study chose the deductive process as the research strategy because it started with specific and clear observations related to the e-government adoption. Bell et al., (2018) confirms that the deductive approach begins with analysing literature to provide a background for the research, identifying gaps between theories or existing evidence, formulating hypotheses, collecting data, and finally, analysing the findings. Using the deductive approach will also allow for the exploration of the associations between variables using quantitative data gathered with questionnaires to test the research hypotheses.

3.2.3 Research Strategy

The research onion suggests that strategies can include action research, experimental research, interviews, surveys, case study research or a systematic literature review. The strategy is chosen based on the data required for the research and the purpose of the study. Yin (2017) indicates that the following three criteria can be used to select the most suitable strategy for research:

1. The type of research question(s)
2. The researcher's control over behavioural aspects
3. Whether the research focusses on contemporary events

Table 3.2 shows how each criterion relates to each research strategy.

Table 3.2. Criteria for different research strategies (Yin, 2017)

Strategy	Type of research question	Control of behavioural aspects	Focus on contemporary events
Experimental	How, Why	Yes	Yes
Survey	Who, What, Where, How	No	Yes

	Many, How Much		
Systematic literature review	Who, What, Where, How Many, How Much	No	Yes/No
Interview	Who, What, Where, Why	No	Yes
Action Research	How, why	No	No
Case Study	How, why	No	Yes

The survey strategy is adopted for this research. This strategy is often linked with the deductive approach and it is commonly used in business research (Bell et al., 2018). With this strategy rich and reliable data can be collected from a representative sample of the population using a questionnaire (Creswell, 2014). The survey strategy can also be used to observe contributing variables among different data that can be used to answer the research question. The survey strategy is generally linked to the deductive approach (Saunders et al., 2019).

3.2.4 Research Method

Research method refers to how research questions will be answered and the general plan for how the information will be gathered, Saunders et al. (2012) identifies mono-method, mixed method and multi-method as possible choices for conducting research in the research onion. The mono-method uses only one method for the study while the mixed method uses two or more methods usually a combination of qualitative and quantitative methodologies. Finally, the multi-method engages a wider selection of methods (Saunders et al., 2012).

This research makes a choice between qualitative and quantitative research methods and chooses a mono-methods for data collection and analysis which is best suited to answer the research questions posed. The quantitative survey method is selected for this

study as explained by Collis and Hussey (2014), it is widely used when undertaking business research. In studies aimed at validating hypotheses, quantitative research is able to elicit the information needed to make decisions based on objective observations without the interference of the researcher (Saunders et al. 2012).

The quantitative data obtained using this design is structured and can be subjected to statistical analysis to draw the conclusions to answer the research questions (Creswell, 2014). According to Creswell (2014) the quantitative method also allows comparisons between several variables. This study requires the analysis and evaluation of several variables as well as the exploration of the relationship between these variables. Therefore, a quantitative applied research methodology was deemed most appropriate.

3.2.5 Research Time Horizons

This refers to the time frame of the research. Generally, observations can be of two types based on time horizons, namely cross-sectional and longitudinal. The cross-sectional design is used when all observations are conducted at a single point of time as occurs in most surveys (Creswell, 2014). Longitudinal data, however, requires observations over a period of time. A cross-sectional survey methodology was selected to capture data from a representative subset of the population of interest at a specific point in time. The cross-sectional design was deemed appropriate because the research questions posed in this study lend themselves to investigating the relationships between multiple variables at the same time (Saunders et al., 2012).

The theoretical and systematic analysis necessary to investigate the specified research hypotheses are also possible with a cross sectional design (Bell et al., 2018). Another advantage of cross-sectional studies is that they are relatively quick and easy to

conduct, and large samples can be surveyed at a reduced cost (Saunders et al. 2012). To obtain reliable and valid research results, a large sample size will be used for this study, this is possible because of the cross-sectional design. Sileyew (2019) confirmed that cross sectional surveys have the greatest potential for reaching a large number of respondents who may be widely dispersed.

3.3 Research Sampling and Population

Sampling in any research is important in order to gather valid and reliable data from the appropriate sample size. Saunders et al. (2012), Creswell (2014) and Collis and Hussey (2014) and others discussed different sampling methods and the need to select the appropriate sampling method to select the appropriate or target population. After reviewing some methodology books and articles, random sampling was adopted for conducting this study. As a sampling technique, random is a probabilistic method that allows unbiased selection of representation of a total target population (Saunders et al. 2012; Collis & Hussey, 2014). Having the intention to recruit an unbiased sample of the total population of public sector departments in Dubai for this study, invitation was sent to various Dubai Government Departments via through their social and official contact platforms.

A total of 345 messages were sent through email, WhatsApp, and official contacts in government department. However, due to delay experienced over five weeks with only twenty responses, the sampling method was changed to convenience sampling. Convenience sampling is a non-probability sampling method where sample is drawn from group of reachable or accessible people (Creswell, 2014). Convenience sampling adopted at the later stage of the data collection phase generated better access to departments that ended up participating in this study. There was also snowball effects

where participants sent the survey link to their contacts in other government departments who are familiar with e-government services and usage. A total of 178 respondents submitted their questionnaires giving a response rate 51.59%.

3.3.1 Sample Size Estimation

A good quantitative research must be designed to have the requisite power to provide valid conclusions for the main hypothesis (Bartlett et al., 2001). Statistical power is defined as the probability of correctly rejecting the null hypothesis when it is false (Kaplan, 1995). The correct sample size is imperative as it impacts the ability to detect the statistical significance of a test (McQuitty, 2004). If the sample size is too small results may be inconclusive and thus the study yields no useful information. Similarly, if a sample size is too large, scarce resources are wasted (McQuitty, 2004). Thus, an appropriate determination of the sample size is a crucial step in the design of a study (Bartlett et al., 2001).

In studies that use structural equation models, the study needs to have adequate sample size to differentiate between good and bad models (McQuitty, 2004). If the power of the statistical test is low, then the null hypothesis will not be rejected and the researcher may accept a false theory, thus making a Type II error (Kaplan, 1995). For structural equation models (SEM) it is generally necessary to have a sample size at least between 150 to 200 respondents (Schumacker & Lomax, 2004) with a minimum of five cases for each parameter in the model to satisfy the assumptions for multivariate analysis (Bentler & Chou, 1987). According to this guideline to use an SEM with 8 independent variables the sample size should be a minimum of 50. This understanding is applied to sample size calculation.

3.3.2 Status of Sample Population

The population for the study is the government workers from several UAE government departments. The departments indicated by respondents are; Dubai Municipality, Ministry of Education, Sharjah Municipality, Central Bank, Ministry of Health, Roads and Transport Authority, Telecommunications Regulations Authority, Dubai Health Authority and Digital Literacy Department. These departments chose to participate because of their use of e-government services and facilities such as electronic government infrastructure, provision of e-government services and the willingness to participate in the survey. The number of respondents from each department is shown in Table 3.3.

Table 3.3: Number of Study Participants from each Government Department

Government Department	Total Number of Responses	Percentage (%)
Dubai Municipality	39	21.91
Roads & Transport Authority	30	16.85
Ministry of Education	29	16.29
Telecommunications Regulation Authority	23	12.92
Sharjah Municipality	17	9.55
Central Bank	16	8.99
Digital Literacy Department	8	4.49
Ministry of Health	6	3.37
Dubai Health Authority	4	2.25
Unspecified	6	3.37
Total	178	100.0

Table 3.3 shows a varied blend of departments participated in this study. It also indicates that several departments in Dubai and environs use one form of e-government or the other. Simple random sampling adopted for this study further ensured that the target sample within the population is reached (Saunders et al. 2012). Employees in operational, mid-management and senior management positions were sent links to respond to the survey. Table 3.4 shows the profile of participants especially their status in their respective organizations / departments.

Table 3.4 Job Profiles of Study Participants

Job Profile	Frequency N=172	Percentage
Management Level		
Top Management	18	10.5
Middle Management	83	48.3
Executive/Administrative	47	27.3
Other	24	14.0
Years in Public Service		
Less than a year	26	14.1
1 to 3 years	44	25.6
3.1 to 7 years	48	27.9
More than 7 years	54	31.4
Years in Current Organisation		
Less than a year	22	12.8
1 to 3 years	69	40.1
3.1 to 7 years	36	20.9
More than 7 years	45	26.2

As shown in Table 3.4 among the 172 participants 10.5% (n=18) were holding top level management positions. However, most, 48.3% (n=83) were middle level managers

while 27.3% (n=47) were executive/administrative level managers. In terms of length of service in government establishments, 14.1% (n=26) have worked for less than a year in government organisations while 31.4% (n=54) had been in public service for more than 7 years. The rest of the respondents had spent between 1-7 years in the government organisation.

In contrast, when asked about the duration of employment in the current organization the largest subset 40.1% (n=69) were those who had spent 1 to 3 years with the current department. A little over a quarter 26.2% (n=45) had worked in their current organization for more than 7 years. This indicate that participants have good level of experience, familiarity and knowledge of the subject being investigated, thereby suggesting that they are able to answer questions in the survey. This level of exposure to the public sector and e-government involvement in the sector is relevant to this study, especially in drawing quality data from responses.

3.4 Data Instrument and Collection Procedure

This is the final layer of the research onion and this captures the techniques and procedures used to gather research data. Here, choices include primary and secondary data collection. Primary data is data collected mainly for the purpose of the investigation being conducted and comes directly from the sample population, whilst secondary data is data that has been collected by other authors for another topic that may provide context for the study. Secondary data can include information from peer-reviewed papers, newspapers, reference books, theses, magazines, journal articles, researches, and the internet (Collis & Hussey, 2014).

It is essentially data that has been collected as primary data by another party and stored in one medium or the other for later retrieval (Creswell, 2014). Primary data sources were used for this study from the information collected from government employees who are randomly selected to participate in the survey. Primary data collection is considered more challenging to acquire because of the need to secure cooperation of the respondents, significant financial expense and consideration of various ethical issues (Saunders et al. 2019). Regardless of these challenges primary data was selected as the most appropriate data source due to the absence of existing data on the parameters being evaluated.

In conduct of surveys the following eight steps have been recommended by Passmore, Dobbie, Parchman and Tysinger (2002).

- (1) State the problem or need,
- (2) Plan the project
- (3) State the research question
- (4) Review the literature
- (5) Develop or adapt existing survey items
- (6) Construct the survey
- (7) Conduct pilot tests, and
- (8) Administer the survey.

Steps one to four (1-4) have been elaborated in chapters 1-2 of the thesis. This leaves steps (5-8) to guide the collection of data to test the research hypotheses. Thus, the data collection started with adapting, and developing sections of the survey items. This is explained further in the next section.

3.4.1 Instrument and Measures

This section presents, justifies and discusses the survey instrument adopted for this study. It also explains how measures for the survey is determined. According to Sreejesh et al. (2014) a meaningful questionnaire is designed to draw information that will fulfil research objectives, it should appeal to respondents, not be too long, too intrusive or too difficult to understand. Questions also need to measure accurately the issue under investigation and thus it is recommended that when possible, to use questionnaires that have already been thoroughly validated and used in research studies that are similar to the proposed research (Sreejesh et al., 2014). That is why measures of instrument from Hossan and Ryan (2016) is adapted to develop the instrument for this study.

The eight constructs adapted from the literature review measured by the questionnaire are; short-term job performance, long-term job performance, client impact, leadership support, training, organisational preparedness, employee attitude and role clarity. These elements are selected to inform the development of the survey but were all reduced to nine because two elements (usage of website and end-user value) were combined. From these elements, a structured 58-item questionnaire with closed ended questions is developed and used in this research. The survey instrument was drawn from previously validated research tool on the 10-factor model of e-government adoption developed by Hossan and Ryan (2016).

Using already validated, previously used survey is supported by authors such as Burton and Mazerolle (2011) and the use of survey for many of the literature reviewed in the previous chapter. Therefore, the survey instrument comprised of nine measurement scales consisting of five items each. The 58-question survey was redesigned to capture

responses on a six-point Likert scale; strongly disagree, disagree, somewhat disagree, somewhat agree, agree and strongly agree. Responses were captured with a six-point scale, from 1= strongly disagree to 6=strongly agree for respondents to rate the extent of their agreement with each statement relating to each concept. This helped to construct a survey that can be administered to the government departments. However, the pilot test was important to validate and determine if the survey is fit for purpose. The pilot test was the next step in the research process before the final stage recommended by Passmore et al. (2002). The next section focuses on the pilot study and data validity.

3.4.2 Pilot Study and Validity

The two most important features in the evaluation of a research instrument or tool are the reliability and validity (Mohajan, 2017). Validity is about how well the instrument measures what it is supposed to measure while reliability is the stability of findings and how well the data obtained from the use of an instrument can be replicated (Mohajan, 2017). Validity is also described as the extent to which the research variables and measures reflect internal consistency and relevance to what is being studied or investigated (Saunders et al., 2012). The reliability measures consistency, precision, repeatability, and trustworthiness of a research (Blumberg et al., 2005; Chakrabartty, 2013).

A detailed assessment of reliability and validity is expected for any instrument used to collect data particularly in the evaluation of the accuracy of psychometric instruments (Mohajan, 2017). The most common measure of reliability and internal consistency used by researchers in business research is the Cronbach's alpha (α) which is an

estimate of the correlation between two random samples of items (Cronbach, 1951). The value of this coefficient of reliability falls between 0 and 1, with perfect reliability being 1, and no reliability = 0. Reliability coefficients of 0.8 or 0.7 are generally acceptable, in business research reliability greater than 0.7 is considered as high (Nunnally & Bernstein, 1994). The Cronbach's alpha is determined for all measures used in the questionnaire for this research.

There are four types of validity tests commonly described in literature i) content validity, ii) face validity, iii) construct validity, and iv) criterion-related validity (Creswell, 2014; Pallant, 2013). For this research, the content validity was determined for all measures. Content validity is the extent to which the questions on the instrument and the scores computed for these questions represent the variables of interest and adequately measure the concept (Creswell, 2014). There is no statistical test to determine content validity and this assessment was based on the judgment of experts in the field (Mohajan, 2017).

In addition to content validity, face validity was also be determined. Face validity is the degree to which a test appears to measure what it claims to measure, and it is a component of content validity (Williams, 2007). It ascertains that the measure appears to be assessing the intended construct under study. If a measure has demonstrated content validity, face validity can be assumed, although face validity does not ensure content validity (Mohajan, 2017). Face validity is easily demonstrated by stakeholders (Mohajan, 2017). The face validity of the questionnaire was assessed by two experienced academics who reviewed the questions before the pilot study. Feedback from this review is used to modify questions to reflect the local context.

A pilot study was also used to address other threats to the validity of the research instrument such as ensuring that survey instructions are clear and adequate alternatives options for responses are provided (Saunders et al., 2012). The process also ensured that questions were presented in the proper order, and questions describe items clearly so that they are not misinterpreted. In addition, the pilot ensured that the questionnaire was not too long or take too much time and it is too hard to read (Mohajan, 2017).

The pilot test was done with 10 employees from the Dubai Municipality (4), Dubai Health Authority (2), Digital Literacy Department (2) and Dubai Police (2). The pilot test approach is recommended to capture the responses of an audience similar to the target audience for the questionnaire to ensure that questions are understood, and responses are consistent with the information the questionnaire is designed to elicit (Creswell, 2014). According to May (2011), piloting also helps to ensure that the questionnaire structure is coherent, objective and user friendly. Completing the pilot helped to generate feedbacks such as irrelevance of two questions, removing demographic questions such as nationality, contractors etc. from options within the demographic questions. The non-theoretical suggestions were taken on board, and adopted to draft the final version of the questionnaire uploaded online.

3.4.3 Data Collection Process

Data was collected using an online questionnaire as mentioned earlier in this chapter. This was viewed as the most appropriate technique considering the focus of the study on employees using computer for their work. Introductory letters were sent to the leadership of each department to obtain permission for the research. Upon acquisition of a written permission, respondents' emails were collated for the distribution of the survey link. An online survey site SurveyMonkey was set up to distribute questionnaires to the staff. Consent forms were incorporated into the online

questionnaires. Though the initial data collection process failed to generate the expected level of response, changing strategy by encouraging participants through known contacts helped to generate more favourable responses.

Respondents were given additional period of four weeks to complete the questionnaire. At the end of this period, 178 respondents had completed the survey, which equates to a response rate of 52%. Out of the 178 questionnaires submitted, there were six responses with incomplete information. The missing values were observed to be missing at random (i.e. the missing values were different for each respondent). One of the recommendations for handling missing data is listwise deletion, omitting the cases with the missing data and analysing the remaining data (Pickles, 2005). As such, these six questionnaires were omitted from analysis. Thus, a total of 172 cases were analysed. Data analysis procedure is explained next.

3.5 Data Analysis

Data obtained from the questionnaire were analysed using IBM SPSS version 22 and IBM SPSS Amos 26 for Structural equation modelling (SEM). Structural equation modeling (SEM) is a series of statistical methods that allow complex relationships between one or more independent variables and one or more dependent variables to be explored. The maximum likelihood estimation technique was used to estimate the models because this technique has been found to generate reliable results even in situations where the data may violate the assumptions of SEM such as normal distribution and large sample size (Chou et al., 2012). SEM done in this study is explained further in the next section.

3.5.1 Structural equation modelling (SEM)

SEM includes two types of factor analysis: exploratory and confirmatory factor analysis. Exploratory factor analysis (EFA) is employed to obtain the structure of a set of measured data (Hair, 2014). EFA assesses the construct validity during the initial development of an instrument. While in confirmatory factor analysis (CFA) is used to validate the hypotheses for unobserved variables and latent variables (Hair, 2014). In conducting SEM analysis, EFA was used to extract the principal factors, and CFA was then employed to validate the latent factor structure. The confirmatory analysis of the 10 factor (discussed above) used the one-factor congeneric model following the approach suggested by (Jöreskog et al., 2001).

One-factor congeneric model allow several observed variables to be reduced to a single composite scale, which takes the unique contribution of each item into account. Through the use of one-factor congeneric model, a set of observed indicator variables are regressed on a single latent variable. This research examined a theoretical model comprising of ten measurement models as identified by (Hossan & Ryan, 2016). These ten constructs are subsequently grouped into three higher level constructs (Performance Expectancy, Facilitating Conditions and Employee Willingness latent construct and Adoption latent construct) consistent with the findings of other authors (Hossan & Ryan, 2016; Pee et al., 2008).

The methodology used to test the congeneric models is the strictly confirmatory approach (Jöreskog et al., 2001). This form of confirmatory test is considered the most rigorous since the focus is on accepting or rejecting a given model. In this approach, the researcher used data to either accept or reject a single a priori measurement model. Similar to the present study, a priori models may be derived from a combination of both theory and data (Jöreskog et al., 2001). The covariance matrix and parameter estimate from the items in each a priori dimension were obtained using Amos 26, and the

maximum likelihood method was used to test the model fit in order to analyse each congeneric model (Jöreskog et al., 2001).

The maximum likelihood method of estimation with medium to large samples, even with any violations of the multi-normality assumptions of the model, has been shown to be relatively robust (Tabachnick & Fidell, 2013). The use of each construct was retained when values were greater than 0.50 (Barclay et al., 1995). The discriminant validity of the measures which is the degree to which items differentiate among constructs or measure distinct concepts was assessed by examining the correlations between potentially overlapping constructs (Barclay et al., 1995).

Items are expected to load more strongly on their own constructs in the model, and the average variance shared between each construct and its measures is expected to be greater than the variance shared between the construct and other constructs (Barclay et al., 1995). The structural model was assessed by examining the path coefficients (standardized betas). T statistics was also calculated to assess the significance of these path coefficients. In addition, R^2 was used to evaluate the overall predictive strength and utility of the proposed model (Stein et al., 2017).

3.5.2 Model Fit

The statistics used to evaluate model fit are parameter estimates (Lambda), t-values, and goodness-of-fit indices. The Lambda coefficients indicate the loading of the latent variable on the items. The associated t-values indicate whether or not a Lambda coefficient is significantly different from zero (Byrne, 2013). T-values greater than 2.00 are regarded to be statistically significant (Byrne, 2013). The goodness-of-fit indices

used in this study are measures of incremental fit. Incremental fit indices test the incremental fit of each *a priori* model over that of a null model.

Thus, incremental fit indices provide measures of the proportional improvement in the fit of a substantive model relative to a null model. The null model specifies zero or null covariance among the manifest variables (manifest variables in the present study are the items in each dimension) and is the most widely accepted form of the null model (Widaman & Thompson, 2003). The model being tested hypothesizes that the covariance among the items significantly differs from zero (Widaman & Thompson, 2003). The commonly used incremental fit indices are relatively independent of the sample size. Thus, they are appropriate goodness-of-fit measures for smaller to medium samples (Widaman & Thompson, 2003). Following on this, the p value which is significance level of data being observed under null hypothesis is determined to generate outcome of each direct hypotheses and moderating hypotheses (Hipp & Bollen, 2003).

The model fit was estimated using the Comparative Fit Index (CFI), and the Incremental Fit Index (IFI) (Cheung & Rensvold, 2002; Hipp & Bollen, 2003). The CFI is the index of choice for model fit where the sample size is relatively small (Cheung & Rensvold, 2002). The IFI was also developed to take into account the issue of small sample size CFI and IFI values greater than 0.9 are generally accepted as indicating a good model fit (Cheung & Rensvold, 2002).

3.6 Ethical Considerations

Every academic study needs to adhere to ethics of research to protect the researcher, participants and institution. As explained by Creswell (2014) ethics relate to principles,

standards of conduct, rights and consent to provide information and use information provided by participants. With this understanding, this research was conducted adhering to the principles of informed consent, voluntary participation and withdrawal as well as confidentiality (Collis & Hussey, 2014; Creswell, 2014). In addition, the research had been conducted in compliance with university regulations and requirements for conducting postgraduate research, while remarks from other authors have been duly referenced.

3.7 Chapter Summary

This chapter has explained the research design and justification for adopting the research design. It also details how participants were chosen and why, the number of participants and the selection process. The research instrument and the procedure for collecting data were also presented. The chapter also states the validation and reliability process for the study instruments and the process of the pilot study; the methods for analysing data to answer the research questions and the statistical software used.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the quantitative analysis and interpretation of the data collected from 172 public officer in Dubai public sector organizations. Sections in this chapter explain the findings and objectively discusses the observations of the hypotheses tested in Dubai. The first section presents the demographic characteristics of respondents. The second section focuses on testing for confirmatory factor Analysis. Section 4.4 presents the Structural Equation Modelling testing as well as findings for the direct and moderating hypotheses. Section 4.5 discusses the hypotheses findings, while the last section summarises this chapter. Content in this chapter is key to achieving the research aim which is “to identify and critically assess the factors influencing the adoption of e-government in Dubai in order to determine the dominant factors that contribute to successful e-government adoption in Dubai public sector departments”.

4.2 Demographic Characteristics of Respondents

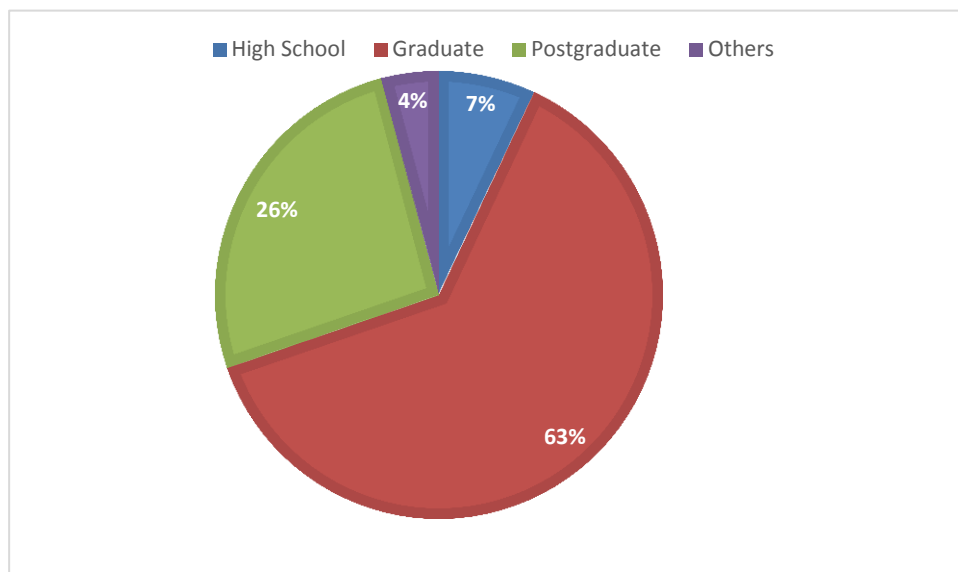
As mentioned in the previous chapter, responses of 172 people were analysed in this study. These respondents have demographic characteristics such as gender and age group which are important to the findings discussed in this study. Table 4.1 shows the gender and age group frequency and percentage of the respondents.

Table 4.1 Demographic Characteristics of Respondents

Sociodemographic Characteristics	Frequency N=172	Percent
Gender		
Male	88	51.2
Female	84	48.8
Age Groups		
18 – 29 years	42	24.4
30 – 44 years	99	57.6
45- 54 years	22	12.8
Above 55 years	9	5.2

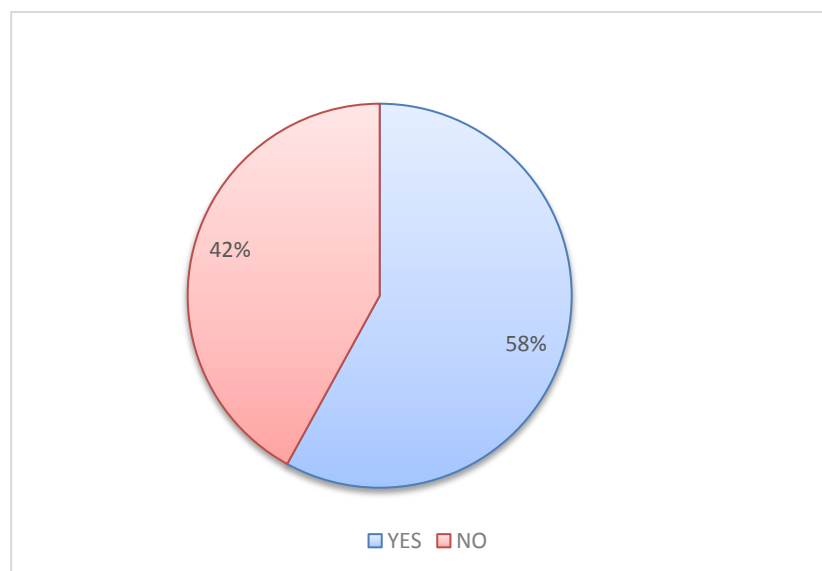
Figure 4.1 shows that out of 172 respondents, 50.6% (n=87) were male and 48.8% (n=84) were female. In terms of age group, the largest percentage 57.6% (n=99) were aged between 30 to 44 years, followed by those age 18 to 29 years 24.4% (n=43). Only nine participants (5.2%) were above 55 years.

Figure 4.1: Education Level of Respondents



With regards to educational attainment shown in Figure 4.1, 7.0 % (n=12) were high school graduates but the majority 62.8% (n=108) had bachelor's degree and more than a quarter 26.2% (n=45) had post-graduate qualification. Closely related to education is the topic of training especially IT training which is relevant to the topic being researched. This question was asked as part of the demographic question for insight into the IT knowledge and competency of the workers in the public sector. The finding is shown in Figure 4.2.

Figure 4.2: Information Technology Training among Respondents



Responses shown in Figure 4.2 demonstrates that while 58% (n=99) had received some IT training 42% (n=73) never had any training. It is important to note this in relation to the discussion later in this chapter and next chapter. To assess training in the use of e-government, respondents were asked if they had received any previous formal/ informal training in eGovernment/Information Technology while in their current department.

4.3 Confirmatory Factor Analysis

Convergent and discriminant validity are both considered subcategories of construct validity (Bryant, 2000). Convergent validity estimates how much scale items are related to each other using the correlation coefficient. The patterns of intercorrelations for all the scale items in each of the 8 constructs being studies was therefore determined. High correlations between scale items indicate that they measure the same construct (Bryant, 2000). Discriminant validity demonstrates that items for each construct are not related and measure different constructs. This is based on the principle that measures of theoretically different constructs should not correlate highly with each other (Bryant, 2000).

Confirmatory factor analysis (CFA) was used to assess both discriminant and convergent validity in this study. CFA is one of most common methods to test whether measures of a construct are consistent with a researcher's understanding of the construct (Kline, 2010). The CFA has replaced older methods of analysing construct validity (Kline, 2010). CFA tests if the data fits a hypothesized measurement model. This hypothesized model is usually based on theory and/or previous analytic research (Jöreskog et al., 2001). This study posits that there are 8 factors accounting for the covariance in the measures, and that these factors are unrelated to one another. The model was tested using structural equation modelling. The model fit measures were used to assess how well the proposed model captured the covariance between all the items or measures in the model.

4.3.1 Convergent Validity

The statistics used to evaluate model fit were the Lambda coefficients which indicate the loading of each scale items on the construct. T-values indicate whether or not a Lambda coefficient is significantly different from zero (Byrne, 2013). T-values greater than 2.00 are regarded as statistically significant (Byrne, 2013). The goodness-of-fit indices used in this study were measures of incremental fit, which are relatively independent of sample size. Model fit was estimated using Comparative Fit Index (CFI), Incremental Fit Index (IFI), and Root Mean Square Residual (RMSR) (Pedhazur & Schmelkin, 2013; Stein et al., 2017).

CFI and IFI values greater than 0.9 are generally accepted as indicating a good model fit (Hipp & Bollen, 2003). The value of the Root Mean Square Residual (RMSR) is interpreted in relation to the sizes of the observed variances and covariances, with obtained RMSR values indicating the average discrepancy between the sample observed and hypothesized correlation matrices (Bollen & Lennox, 1991). A RMSR value of 0.05 or less indicates a good fit, with values between 0.05 and 0.08 indicating an acceptable fit (Byrne, 2013). As shown in Table 4.2 all 8 constructs demonstrated convergent validity with almost all items having correlation coefficients greater than 0.5. Model fits were also acceptable all CFI and IFI values >0.9.

Table 4.2 Convergent Validity Test for 8-factors

Constructs				Model Fit Indices		
	Indicators	Correlation Coefficients	T-Value	CFI	IFI	RMSR
Leadership Support (LS)	LS1	0.07	18.66	0.94	0.94	0.071
	LS2	0.77	12.61			
	LS3	0.00	16.93			
	LS4	0.69	12.03			

	LS5	0.80	12.54			
Short-Term Job Performance (SP)	SP1	0.02	23.41	0.96	0.96	0.063
	SP2	0.01	22.46			
	SP3	0.81	15.14			
	SP4	0.07	23.55			
	SP5	0.92	17.73			
Long-term Performance (LP)	LP1	0.47	6.63	1.00	1.00	0.028
	LP2	0.39	7.86			
	LP3	0.93	13.85			
	LP4	0.79	12.49			
	LP5	0.27	4.52			
Client Impact (IM)	IM1	0.62	15.26	0.96	0.96	0.047
	IM2	0.88	24.14			
	IM3	0.52	11.79			
	IM4	0.95	22.99			
	IM5	0.47	11.52			
Organizational Preparedness (OP)	OP1	0.34	5.70	0.96	0.97	0.042
	OP2	0.57	7.25			
	OP3	0.01	0.16			
	OP4	0.91	10.31			
	OP5	0.76	8.72			
Role Clarity (RC)	RC1	0.71	10.62	0.98	0.98	0.053
	RC2	0.94	14.66			
	RC3	0.96	16.09			
	RC4	0.58	8.77			
	RC5	0.93	14.69			
Training Support (TS)	TS1	0.72	8.70	0.93	0.93	0.086
	TS2	0.73	9.69			
	TS3	0.28	3.68			
	TS4	0.52	6.55			
	TS5	0.75	9.82			
Employee Attitude (AT)	AT1	0.96	16.09	0.93	0.93	0.075
	AT2	0.87	14.17			
	AT3	0.60	10.27			
	AT4	0.76	14.22			
	AT5	0.53	8.29			

4.3.2 Discriminant Validity

Discriminant validity implies that measures that are not related are not related in reality.

To estimate the degree to which the factors under study are related to each other we use the correlation coefficient. According to Trochim (2019), the patterns of

intercorrelations among measures reflects both convergent and discriminant validity. Correlations between theoretically similar measures should be “high” while correlations between theoretically dissimilar measures should be “low” (Trochim, 2019). Although there are no firm rules for how high or low the correlations need to be to confirm convergent or discriminant validity however it is expected that convergent correlations should always be higher than the discriminant ones (Trochim, 2019). The discriminant validity test is shown in Table 4.3.

Table 4.3 Discriminant Validity Test

		1	2	3	4	5	6	7	8
1	Leadership Support (LS)	0.85							
2	Training Support (TS)	0.46	0.67						
3	Organisational Preparedness (OP)	0.44	0.22	0.56					
4	Short Job Performance (SP)	0.25	0.21	0.22	0.47				
5	Attitude (AT)	0.24	0.30	0.11	0.10	0.62			
6	Role Clarity (RC)	0.50	0.34	0.38	0.19	0.22	0.67		
7	Long Job Performance (LP)	0.11	0.04	0.16	0.09	0.01	0.16	0.32	
8	Client Impact (IM)	0.09	0.03	0.15	0.11	0.02	0.11	0.21	0.33

** p<0.01; * p<0.05

Note: Square roots of average variance extracted are values in italic and the diagonal values are in bold.

Looking at Table 4.3 we see that Organizational Support has higher coefficients ($R > 0.3$) with Leadership support, Training Support and Organizational Preparedness which are all categorized as factors under the latent measure “facilitating conditions”. However, the coefficients are lower ($R < 0.3$) for Short-term job performance, Attitude, Long-term job performance and Client Impact which are

factors under “Performance expectancy”. This demonstrates discriminant validity for the “Performance expectancy” measures and for Attitude (0.16) but not for Role Clarity ($R = 0.35$).

Similarly, it is noticed that while Leadership support is convergent with organizational support, organizational preparedness and training support ($R > 0.4$) it is discriminant from short job performance, Long job performance and Client Impact but not Role Clarity. In summary we see that leadership support, training support and organizational preparedness seem to reflect the same construct. However, short job performance, long job performance and client impact do not demonstrate convergence and all measures appear to be discriminant from other measures. With regards to measures under “employee willingness” the correlation between Attitude and Role Clarity was higher than the correlation between attitude and any one of the following: short job performance, long job performance and client impact.

This demonstrates discriminant validity between measures of “employee willingness” and measures of “Performance expectancy”. With regards to the correlation between independent variables and the adoption variable (dependent variable), the strongest correlation is observed between adoption and role clarity ($R = 0.47$); leadership support ($R = 0.45$) and Attitude ($R = 0.43$) while all other independent variables had lower coefficients. The discriminant validity findings were noted in view of further analysis done such as the Cronbach’s Alpha test for constructs reliability.

4.3.3 Reliability Statistics

Cronbach's Alpha was used to test for reliability of constructs. All scales achieved more than 0.7 alpha values except Training Support and Attitude. For Role Clarity – Initial alpha value was 0.647. However, Alpha value increased to 0.743 after deleting Q47 (I am NOT very sure about how my current duties and responsibilities can play an important role in eGovernment development). Therefore, the final scale has four items.

For Attitude – Initial Alpha value was 0.524. This increased to 0.743 after deleting Q23 (eGovernment assists me in doing my work). Therefore, the final scale has four items. This implies that the items selected to measure the constructs “training support” and “attitude” had moderate internal consistency and the individual items in the scale were not highly correlated. The Cronbach’s alpha for each of the construct and the number of items retained in each scale are shown in Table 4.4.

Table 4.4: Reliability Statistics for Research Constructs

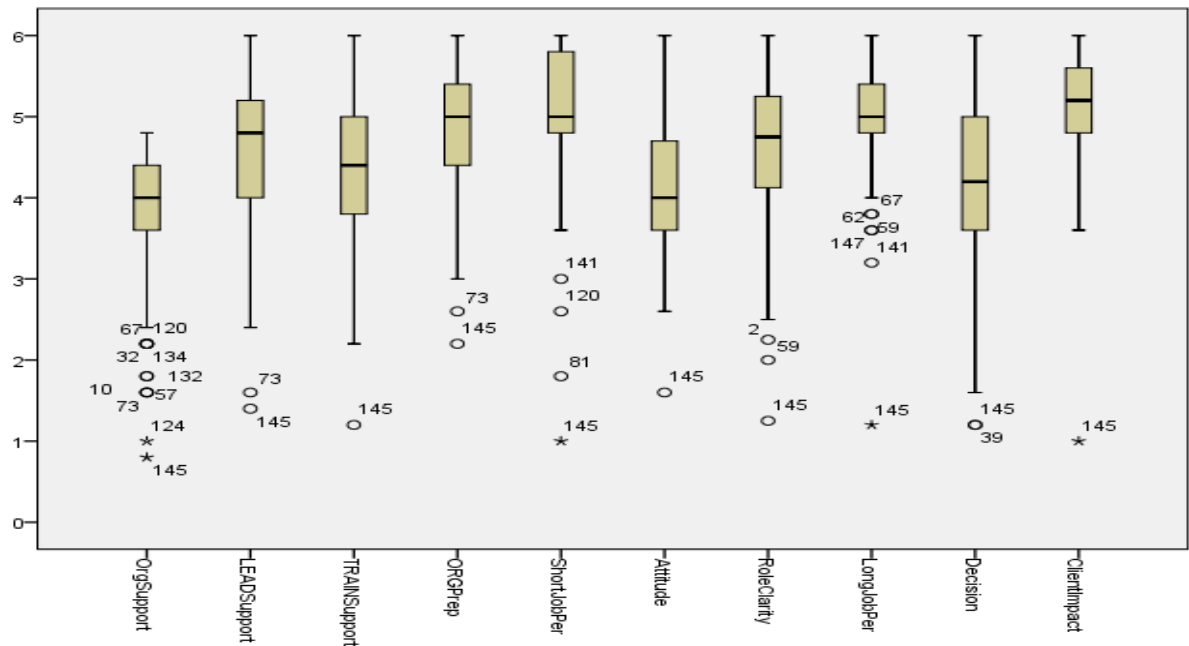
Construct	Cronbach's Alpha	Number of Items
Leadership Support	0.863	5
Short Job Perm	0.830	5
Long Job Perm	0.770	5
Client Impact	0.770	5
Organizational Preparation	0.745	5
Role Clarity	0.743	4
Training Support	0.700	5
Attitude	0.743	4
E-govt Adoption	0.740	5

To address concerns about common method variance which occurs when the variations in responses are from the survey instrument rather than the actual predispositions of the

respondents (Podsakoff et al., 2003) the one factor test was applied (Podsakoff et al., 2012). All scale items for each of the 8 constructs assessed with the questionnaire were loaded into one common factor. There was no single factor which accounted for more than 50% of the total variance in the data set. Consequently, common method bias was not viewed as an issue for the data in the current study.

To assess the empirical distribution of the data a graphical method was used. A histogram and Normal Q-Q Plots were used to check for normality. Graphical plots have the advantage of being easy to interpret and outliers are easily identified. The normal probability plot, also known as the quantile-quantile plot (QQ plot) was used to compare the survey data distribution against the standard normal distribution. A high correlation between the sample data and normal quantiles indicates that data has a normal distribution. This is indicated by data the points plotted in the QQ plot falling approximately on a straight line (Filliben, 1975). One outlier was identified (Case 145) in which all questions had 1 or 2 inputted as shown in the Figure 4.3 depicting the Box Plot below.

Figure 4.3: Box plot of the distribution of responses for each construct



Visual inspection revealed that data were normally distributed, there was a bell-shaped curve in the histogram with mostly negatively skew and cases fall more or less in a straight line in the Q-Q Plot.

4.4 Structural Equation Modelling

Structural equation modelling (SEM) was used to simultaneously test all variables in each hypothesized model to determine the extent to which it is consistent with the data (Byrne, 1994). This research is based on the framework presented in Chapter two to explore the roles of eight variables categorized under Performance expectancy, Facilitating conditions and Employee Willingness (Employee Factor in the model). The variable “Adoption” (Decision) of e-services was used as the dependent variable and the outcome of interest while short-term performance expectancy, long-term performance expectancy and Client Impact were the explanatory variables.

The pathway analysis with the corresponding co-efficient are presented to depict the direct and indirect relationships between the observed and latent variables. The hypothesized relationships between observed variables and three constructs (Facilitating

conditions, Performance expectancy and Employee Willingness). Parameter Estimates (β), Critical Ratio (C.R), Standard Error (S.E) and P-values for Pathways were defined in the structural model. For a significance level of 0.05, critical ratio that exceeds 1.96 would be considered significant. The analysis assumed a fit between Facilitating Conditions, Performance Expectancy and Employee Willingness Latent constructs and E-government Adoption.

4.4.1 Testing for Direct Hypotheses

Following on the SEM, further analysis was conducted by exploring the association of each construct with adoption of e-government construct. The following direct hypotheses were tested:

- H1a: Short-term job performance influences adoption of e-government services.
- H1b: Long-term job performance influences adoption of e-government services.
- H1c: Client impact influences adoption of e-government services.
- H2a: Leadership support influences adoption of e-government services.
- H2b: Employee training influences adoption of e-government services.
- H2c: Organizational preparedness support influences adoption of e-government services.
- H3a: Employee attitudes towards e-government influences adoption of e-government services.
- H3b: Role clarity influences adoption of e-government services.

The coefficients between Leadership Support (LEADSupport), Training Support (TRAINSupport); Organisational Preparation (ORGPrep) and the Facilitating Condition

(FacCon) latent construct were all positive and significant ($P < 0.001$). None of the three observed variables (Short-Term Job performance, Long term Job Performance and Client Impact) under the latent construct of Performance Expectancy significantly loaded on this construct ($P > 0.05$). Similarly, Role Clarity and Employee Attitude did not load significantly on the latent construct of Employee willingness ($P > 0.05$).

In estimation of the higher order model between the three latent constructs and Adoption, neither Employee Willingness nor Performance expectancy significantly influenced the Adoption of E-government services ($\beta = 0.147$, $P\text{-value} = 0.754$; $\beta = -0.362$, $t\text{-value} = 0.780$) respectively. However, the coefficient between Facilitating conditions latent construct and Adoption of eGovernment services, indicates that Facilitating conditions significantly and positively influenced the Adoption of E-Gov ($\beta = 1.003$, $P\text{-value} = 0.004$). The result for these hypotheses is presented in Table 4.5.

Table 4.5 Testing of Direct Hypotheses

Direct effect	Estimate	S.E.	C.R.	Level	E-govt adoption
Adoption of E-Government Services<--- Short-term Job Performance	0.485	0.106	4.586	$P < 0.000$	<i>H1a accepted</i>
Adoption of E-Government Services<--- Long-term Job Performance	0.317	0.161	1.973	$P < 0.049$	<i>H1b accepted</i>

Adoption of E-Government Services<--- Client Impact	-0.325	0.162	-2.007	$P<0.045$	<i>H1c accepted</i>
Adoption of E-Government Services<--- Leadership Support	0.222	0.111	2.008	$P<0.045$	<i>H2a accepted</i>
Adoption of E-Government Services<--- Employee Training	0.290	0.098	2.949	$P<0.003$	<i>H2b accepted</i>
Adoption of E-Government Services<--- Organizational Preparedness	0.285	0.110	2.597	$P<0.009$	<i>H2c accepted</i>
Adoption of E-Government Services<--- Employee Attitude	0.506	0.072	7.025	$P<0.000$	<i>H3a accepted</i>
Adoption of E-Government Services<--- Role Clarity	0.536	0.069	7.728	$P<0.000$	<i>H3b accepted</i>

As shown in Table 4.5, the regression coefficient of the association between Short-term Job Performance (ShortjobPer) and Adoption construct, indicates that Short-term Job Performance (Shortjob) construct was a significant factor influencing the Adoption of E-services ($\beta=0.45$, $p\text{-value}=0.000$). This finding supports Hypotheses 1a. Similarly, long-term Job Performance (LongJobPer) emerged as a significant explanatory variable

for adoption of e-government ($\beta=0.317$, $p\text{-value}=0.049$). This finding is consistent with Hypotheses 1b.

Further to this, we assumed a fit between Client Impact (ClientImpact) and Adoption construct. The regression coefficient between Client Impact (ClientImpact) and Adoption indicates that Client Impact (ClientImpact) measurement model negatively and significantly influenced Adoption ($\beta=-0.325$, $p\text{-value}=0.045$). The model fit indices reveal that the model is a good fit to the data CFI, NFI, NFI values were all >0.9 . This finding was consistent with Hypotheses 1c.

Hypothesis 2 assumes a fit between variables categorized under Organisational Facilitating Conditions and Adoption of E-service construct. The regression coefficient of the association between Leadership Support (LeadSupport) was a significant factor influencing the Adoption construct. This finding supports Hypothesis 2a. The regression coefficient of the association between employee training was also a significant factor influencing the Adoption of E-services which supports Hypothesis 2b.

It is seen that Training Support (TrainSupport) and Organisational Preparedness (OrgPrep) significantly and positively influenced the Adoption construct. The Model Fit Statistics demonstrate that this model is a good fit ($NFI= 1.000$, $CFI= 1.000$, and $IFI= 1.000$). Leadership Support (LeadSupport); Training Support (TrainSupport) and Organisational Preparedness (OrgPrep) significantly and positively influenced the Adoption construct. The Model Fit Statistics demonstrate that this model is a good fit ($NFI= 1.000$, $CFI= 1.000$, and $IFI= 1.000$) which supports Hypothesis 2c.

Employee Attitudes and Role Clarity were the two variables considered under the Employee willingness construct constituting Hypothesis 3. Based on data analysis conducted, it is assumed that there is a fit between Employee Attitudes model and

Adoption. The direct path coefficient was positive and significant between Attitude towards eGov Service (Attitude) measurement model and Adoption ($\beta=0.506$; $P=0.000$). This outcome supports hypothesis 3a. Likewise, Role clarity was significantly associated with Adoption of eGov Service ($\beta=0.536$, $P\text{-value}=0.000$). The model fit statistics demonstrate a good fit, supporting hypothesis 3b. Therefore, the summary of the direct hypotheses tested for hypotheses 1a,1b, 1c, 2a, 2b, 2c, 3a and 3b is presented in Table 4.6.

Table 4.6 Summary of Direct Hypotheses Testing

H	Direct Hypothesis	Accepted/ Rejected
H1a	Short-term job performance influences adoption of e-government services.	Accepted
H1b	Long-term job performance influences adoption of e-government services.	Accepted
H1c	Client impact influences adoption of e-government services	Accepted
H2a	Leadership support influences adoption of e-government services.	Accepted
H2b	Employee training influences adoption of e-government services.	Accepted
H2c	Organizational preparedness support influences adoption of e-government services.	Accepted
H3a	Employee attitudes towards e-government influences adoption of e-government services.	Accepted
H3b	Role clarity influences adoption of e-government services	Accepted

This result tends to align with the findings from literature. Following the trend and validation from the analysis conducted, the moderating hypotheses are also tested. The testing analysis is presented interpreted in the next section.

4.4.2 Testing for Moderating Hypotheses

Findings observed in prior studies with regards to the moderating effects of age and gender on the relationship between user attitude and adoption of e-government have been mixed. The following hypotheses are tested to estimate the magnitude of association between the decision to use e-government services and employee attitude and role clarity and how these relationships are influenced by moderators (age and gender). Hypotheses on Moderating Effects:

- H4a: Employee age moderates the relationships between attitude towards e-government and adoption of e-government services.
- H4b: Employee age moderates the relationships between role clarity and adoption of e-government services.
- H4c: Gender moderates the relationships of employee attitudes towards e-government and adoption of e-government services.
- H4d: Gender moderates the relationships of role clarity and adoption of e-government services.

Absolute fit indices determine how well the a priori model fits the data. Further analysis done on the eight constructs reveal that the Degrees of Freedom = 39, Squares Chi-Square = $p < .001$, GFI= 0.085 demonstrate that the Model is not a good fit for the data. Moreover, incremental fit statistics (NFI= 0.081, CFI=0.065, and IFI= 0.085) also

indicate that this model is not a good fit to the data. In situations with small sample size (<200) CFI and IFI values greater than 0.9 are generally accepted as indicating the model is not a good model fit (Cheung & Rensvold, 2002). Further analysis was conducted by exploring the association of each construct and moderating effect with adoption of e-government construct. Table 4.7 illustrates the moderating effect of age and gender on the relationship between attitude and e-government adoption as well as on the relationship between role clarity and e-government adoption.

Table 4.7: Testing for Moderating Effect

The moderating effect	S.E.	Sig. level	Decision
Adoption of E-Government Services<--- Employee Attitude X Age of Employee	0.057	0.487	<i>H4a rejected</i>
Adoption of E-Government Services<--- Role Clarity X Age of Employee	0.058	0.296	<i>H4b rejected</i>
Adoption of E-Government Services<--- Employee Attitude X Gender of Employee	0.064	0.746	<i>H4c rejected</i>
Adoption of E-Government Services<--- Role Clarity X Gender of Employee	0.061	0.653	<i>H4d rejected</i>

As shown in Table 4.7, the estimate of the interaction effect of age on employee attitude towards e-government services and e-government adoption was not significant $p=0.487$. In this study, there was no moderating effect of age observed for attitude. As such hypothesis 4a was rejected. Similarly, the testing for moderating effect is presented in Table 4.6 shows that the moderating effect of age on the relationship between role

clarity and e-government adoption was $p=0.296$. This means that hypothesis 4b is rejected. Gender was not a moderator for the relationship between attitude and e-government adoption ($p=0.746$). Based on the value of 1.000 of CFI which is the index of choice for model fit when the sample size is relatively small (Cheung & Rensvold, 2002) the model was a good fit. CFI and IFI values greater than 0.9 are generally accepted as indicating a good model fit (Cheung & Rensvold, 2002). As such hypothesis 4c was rejected.

The test of the moderating effects of gender on the relationship between Role Clarity and Adoption revealed that no significant effect exists. Furthermore, gender was not a moderator for the relationship between Role Clarity and Adoption ($p=0.653$). The CFI and IFI values were greater than 0.9 for the models indicating that models are a good fit with the data. Like other moderating effect tests, this one also indicated that hypothesis 4d is rejected. Summary of the moderating hypotheses tests is presented in Table 4.8.

Table 4.8 Summary for moderating effects

H	Hypothesis (Moderating Effects of Age and Gender)	Accepted/ Rejected
H4a	Employee age moderates the relationships between attitude towards e-government and adoption of e-government services.	Rejected
H4b	Employee age moderates the relationships between role clarity and adoption of e-government services.	Rejected
H4c	Gender moderates the relationships between employee attitudes towards e-government and adoption of e-government services.	Rejected
H4d	Gender moderates the relationships between role clarity and adoption of e-government services	Rejected

Unlike the test for direct hypotheses, the moderating effect testing shows that all moderating hypotheses were rejected in Dubai public sector departments.

4.5 Discussion

This chapter has presented and interpreted the results from testing both direct and moderating hypotheses developed from deductions made in literature. As proposed, the results from testing eight hypotheses in nine government departments / organisations delivered part of the results deduced from literature. From the results of the set of hypotheses classified under hypothesis 1, it can be concluded that a positive relationship exists between performance expectancy and e-government adoption in Dubai government departments. The study shows that specifically within public sector organisations and departments, short-term job, long-term job performance and client impact influence adoption of e-government services in Dubai.

H1 result aligns with the argument presented by Al-Sobhi et al. (2011), Rana et al. (2013), Weerakkody et al. (2013), Chowdhury and Ryan (2016), Kurfalı (2017), Thao (2017), Lallmahomed et al. (2017) and Rokhman (2011). As explained in Chapter two, these authors all strongly explained that performance expectancy, effort expectancy and social influence are significantly related to behavioural intention to adopt e-government. In alignment with this, the study finding shows a positive correlation between performance expectancy and e-government adoption in Dubai government departments. Therefore, it can be inferred that G2E would thrive with the understanding that short-term job performance, long-term job performance and client impact are all significant for the adoption of e-government usage in Dubai public sector, and in other public sector in UAE.

Similar to hypothesis one, the second hypothesis also generated a result projected from literature deductions. This hypothesis particularly sought to the influence of leadership support, employee training and organizational preparedness support on e-government adoption in Dubai public sector department. Showing a positive correlation confirms the main proposal that a positive relationship exists between facilitating conditions and e-government adoption in Dubai government departments. Dubai being the most advanced Emirates in the UAE in the adoption of technology and e-services, it is no surprise. However, one of the problems that motivated this study is addressed through this result. The result is also confirmed by the explanations provided by Rokhman (2011), Chowdhury and Ryan (2016), Rabaa'i (2017), Thao (2017) and Lallmahomed et al. (2017) and all argue for performance expectancy, effort expectancy and social influence relate to any form of behavioral intention to adopt e-government. While such behavioural intention factors may vary significantly, it has been objectively decided through this study that leadership support, employee training and organizational preparedness support are the main factors that influence adoption of e-government services in Dubai.

The last set of direct hypotheses tested in this study show that positive relationship exists between employee willingness and e-government adoption in Dubai public sector departments. As explained in the literature review, progress in G2E is rather slow UAE, but where it is most widely used in Dubai factors such as employee attitudes and role clarity are important in the usage of e-government services. The two direct hypotheses tested were all accepted in this study and further confirms what previous studies have allured to.

Authors such as Al-Refaie and Ramadna, (2020) indicated that employee willingness and belief in the relevance of their role effects E-government adoption in Jordan. It

infers that if operational in Jordan, similar factors play important role in the UAE which is another Arab country. As explained by Ozkan and Kanat (2011); Alomari et al. (2012); Ziemba et al. (2013); Al-Hujran et al. (2015) and Kurfali et al. (2017), attitude of any individual and appropriate level of willingness to use technology determines their eventual usage of e-government services. This is also found to be through the affirmative results in this study.

Unlike the direct hypotheses, the moderating hypotheses did not deliver the same result as proposed from literature. All moderating hypotheses were rejected, indicating that neither age nor gender moderate the adoption of e-government services in Dubai. Though studies of Wegge et al. (2008); Shirom et al. (2008); Kacmar et al. (2011); Ali, Kulik and Metz (2011) and Wang et al. (2013) argue in support of both age and gender as moderators or determinants in organisation related issues. It is discovered through this study that it is not the case in Dubai. However, the rejected hypothesis that adoption of e-government services in Dubai public sector departments is moderated by variables can be explained from literature.

Recent work in e-government or technology adoption reveal that personal values such as environmental concern and time consciousness moderate rather than demographic factors (Belanche, Casaló, & Flavián, 2012). Taipale (2013) also argued in support of the role of economic and geographical predictors in the use of e-government services in addition to socio-demographic factors. This implies that it is possible that other factors besides demographics such as age and gender may moderate the adoption of e-government services in Dubai. This assumption influences the recommendations for future research in the next chapter.

Therefore, based on the empirical results from this study, it can be concluded that short-term job performance, long-term job performance and client impact are all significant factors that influence the adoption of e-government services in Dubai. Similarly, leadership support, employee training and organizational preparedness support all have positive relationship with the adoption of e-government services in public sector organisations and departments in Dubai. The results further revealed that factors such as employee attitudes and role clarity are the two factors instrumental to ensuring that positive relationship exists between employee willingness and e-government adoption in Dubai public sector departments. These three hypotheses and their sub-hypotheses were all accepted indicating that strong relationships exist between all factors and e-government adoption.

While all moderating hypotheses were rejected, the empirical results generated from moderating effect testing have made contribution to knowledge. All four moderating hypotheses propose that; age moderates attitude towards e-government adoption; employee age moderates the relationship between role clarity and e-government adoption; gender moderates the relationship of employee attitudes towards e-government adoption and gender moderates the relationships of role clarity and e-government adoption have all opened up opportunity for future research. Through all four hypotheses were rejected, these empirical results are a contribution to knowledge indicating that other moderating factors exists in Dubai context. Results with potential explanations supported by Belanche et al. (2012) and Taipale (2013), but with scope that exceed that of this current study.

4.6 Summary of the Chapter

This chapter has presented the individual and organizational characteristics of study participants. The test of validity of the 9 constructs used in the study is presented. The structural model for the direct hypotheses was measured and the results of the structural equation modelling to assess the relationships between the dependent and independent variables was also shown. A graphical representation of the pathway analysis with coefficients is shown to visualize the structural model. The chapter demonstrates that research direct hypotheses testing conducted through the structural equation modeling of the manifest variables were accepted. The moderating hypotheses on the effects of age and gender were however rejected. The practical implications of these findings and the recommendations for future application of the model is presented in Chapter 5.

CHAPTER 5: CONCLUSION, IMPLICATIONS, LIMITATIONS, THEORETICAL CONTRIBUTIONS AND SUGGESTIONS FOR FUTURE RESEARCH

5.1 Introduction

This chapter presents the overall conclusion of this study and thesis. It discusses the implications of empirical results, the limitations of this study, the theoretical contributions made and suggestions for future researchers to adopt where possible. This chapter is structured to start with summary of findings as it aligns with the research objectives as well as overall results. The theoretical and practical implications are discussed in sections 5.3 and 5.4 respectively, while the last section is the limitations and suggestions for future research.

5.2 Summary of Findings

This empirical study is undertaken to examine the concepts of e-government and its global adoption and to critically assess factors that influence e-government adoption specifically in Dubai. Other objectives outlined in the first chapter also aimed to determine and assess the moderating factors that influence e-government adoption in Dubai public sector departments as well as to provide recommendations for enhancing e-government adoption in Dubai and successful adoption of e-government services in UAE. It can be inferred that based on the information presented in chapters two and four, and justification for the methods adopted to conduct this study, three of these objectives have been achieved. The pending objective is achieved by the writing this chapter which contains the recommendations for enhancing e-government adoption in Dubai.

Through the involvement of 172 surveys analysed collected from nine organizations and departments, 50.6% were male and 48.8% were female. The largest percentage 57.6% were aged between 30 to 44 years, followed by those age 18 to 29 years 24.4%. Only nine participants (5.2%) were above 55 years. The age group distribution is likely to have driven the results generated in this study which show that direct hypotheses are accepted, but all moderating hypotheses are rejected.

The finding shows that short-term performance, long-term performance, client impact, leadership support, employee training, organizational preparedness support, employee attitudes and role clarity are the eight factors that influence e-government adoption in Dubai public sector organisations and department. This result is not only significant for the purpose of determining hypotheses, they also helped to achieve the second objective of this study which is to assess factors that influence e-government adoption in Dubai and UAE. The eight factors (8-factor) identified and tested in this study are seen to have strong relationships with e-government services adoption in the nine organisations and departments researched.

This specific finding is well grounded in theory and intrinsic context of organisational studies. The 8-factor are a combination of factors identified from the theories such as UTAUT (Venkatesh et al., 2013) and the 10-factor model (Hossan & Ryan, 2016). The robustness of the UTAUT factors when applied to organisational context have been emphasised in studies (Al-Sobhi et al. 2011; Rana et al. 2013; Weerakkody et al. 2013; Kurfali, 2017; Thao, 2017; Lallmahomed et al. 2017) who all revealed that performance expectancy, effort expectancy and social influence and their associated variables are vital to e-government adoption.

Combining factors from the 10-factor model makes position this study as a unique contribution to knowledge because it advances existing model such as the UTAUT and 10-factor models respectively. Achieving the second objective is therefore fundamental component of this study because it led to the development of a unique model for the UAE public sector context for enhancing G2G e-government adoption. As shown in Figure 5.1 performance expectancy need to have three key variables or dimensions in order to generate expected result regarding e-government adopting within and among the public sector officials. A finding that is also supported by authors such as Al-Shafi and Weerakkody (2010), Rehman et al. (2012) and Thao (2017).

Figure 5.1: G2G 8-Factor Model

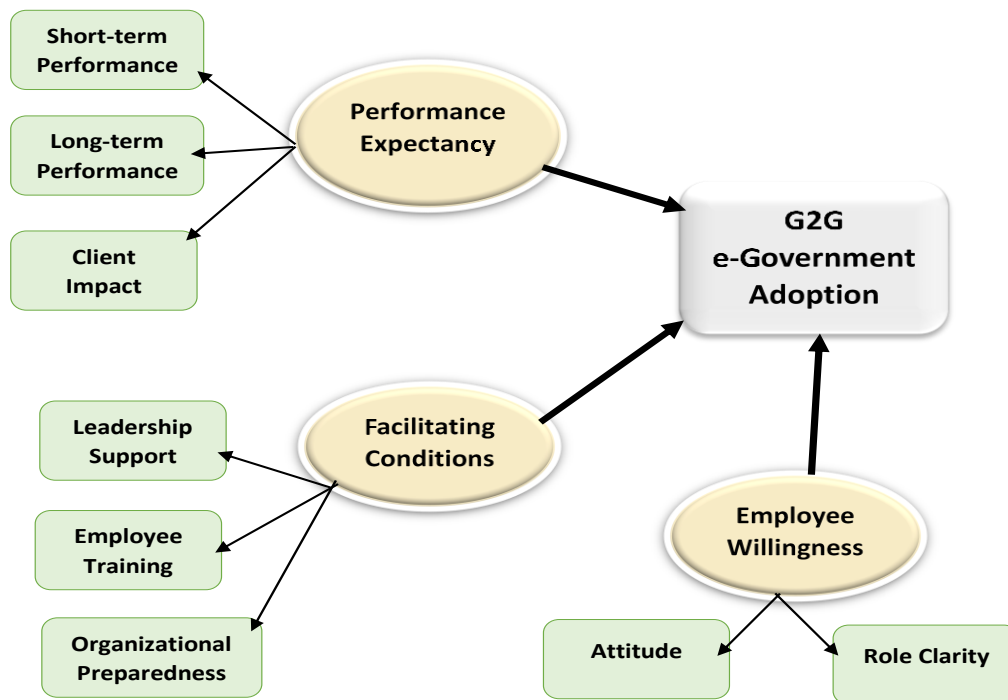


Figure 5.1 shows that facilitating conditions require the presence of positive relationships between factors such as leadership support, employee training and

organizational preparedness within public sector departments to encourage e-government adoption. Similarly, employee willingness and its dimensions such as attitude and role clarity would have positive influence on e-government adoption in the public sector. These findings are supported in literature on studies by Alomari et al. (2010) Rokhman (2011), Weerakkody et al. (2013) and Kurfalı (2017), including those that focused on the Arab countries.

Employee willingness studies exposed the role attitude towards technology play in influencing adoption (Alomari et al. 2012; Al-Hujran et al. 2015; Kurfalı et al. 2017; Ozkan & Kanat, 2011; Ziemba et al. 2013) and those of role clarity (Hossan & Ryan, 2016) in adoption in the public sector. Though factors within facilitating conditions and employee willingness identified by these authors differ from those combined and tested in this study, it implies that the role of facilitating conditions and employee willingness in G2G e-government adoption need to be given attention in the public sector especially in the UAE. This may perhaps enable the government improve its global ranking in the e-government readiness index.

Based on the empirical results which indicated that positive relationships exist between performance expectancy and e-government services adoption, it can be inferred that factors such as short-term performance, long-term performance, client impact are not only accepted hypotheses in a research, they are instrumental to enhancing the adoption and usage of e-government services in Dubai and UAE in general. Similar inference can be made for other five factors which were observed to demonstrate positive relationship in this study. It can thus be deduced from the results that facilitating conditions and employee willingness are essential for e-government adoption in Dubai public sector departments. These factors and conditions they generate in organizations and the public sector in general would enhance the adoption and better usage of e-government

services. These results have practical implications for Dubai, UAE and other countries where these results may be applicable.

As discussed in the previous chapter, all moderating hypotheses were rejected. As a result, it is evident that neither gender nor age moderates e-government services adoption. It was specifically revealed in this study that employee age does not moderate the relationship between attitude towards adoption of e-government services nor do they moderate the relationship between role clarity and e-government services adoption. As explained in previous chapter, rejected hypotheses is not disappointing, but merely reveal areas for further research to investigate the 'Why' the result provided such result, and the 'What' actually operates in the public sector in Dubai. This is further discussed in the last section of this chapter as suggestions for future research.

In theoretical context, this result also helps to achieve the third objective which is to determine and assess the moderating variables or factors that influence e-government adoption in Dubai public sector departments. While gender and age were identified from literature as moderators of e-government adoption, it was proved to be negative in Dubai. While this result challenges existing scope of study in this field, it also ascertains that the moderators identified in literature are not moderators in Dubai public sector. Which raises the question of what are the moderators of the relationship between attitude towards e-government, and the actual adoption of e-government services in Dubai? It also generates similar questions for moderators in relation to role clarity, gender in relation to employee attitudes as well as role clarity to e-government services adoption in Dubai.

On the basis of results summarised, it is deducted that this study has opened up more areas to research going forward, and how such findings may impact the public sector

departments in Dubai. Though inconclusive findings for these sets of moderating hypotheses, it can still be concluded that based on the established study aim and scope which are already covered, the purpose for undertaking this study is achieved. The research results therefore have implications for theory and practice which are discussed in the next couple of sections.

5.3 Implications for Theory

The theoretical implications for this study can be classified into four. First, the attempt to investigate the relationship between demographic information as a moderating variable in determining the relationship between employee attitude towards e-government adoption is the first. Similarly, employing demographic information as a moderating variable in determining the relationship between role clarity and e-government adoption is new in studies. Though the moderating hypotheses were rejected in Dubai public sector, this study acknowledged that e-government adoption can be moderated by variables especially others mentioned in Chapter two.

Another theoretical implication is that this study extends several theories such as reasoned action theory (Davis et al. 1989), TAM (Davis, 1989), model of motivation (Davis et al. 1992), Planned behavioural theory (Ajzen, 1991), Combination of TAM and TPB (Taylor & Todd, 1995), PC utilization (Thompson et al., 1991), Diffusion of innovation (Rogers, 1995), Theory of social cognition (Compeau & Higgins, 1995). It particularly contributes to the understanding and premise of the 10-factor theory (Chowdhury & Ryan, 2016) as well as UTAUT (Venkatesh et al., 2013). It advances the 10-factor theory by providing explanations for 8-factor theory in Dubai, and challenges current premise of UTAUT which identified age and gender as predictors of

technology acceptance. While this study does not refute existing theories, it provides motivations to expand the scope of technology acceptance theories to incorporate organizational aligned variables since this study have identified key organizational factors that influence e-government adoption.

Third, this study has helped to identify the nature of influences between factors, and in determining that positive relationship exists between factors of e-government adoption. This result indicate that management may need to put measures in place to promote and better manage factors such as short-term job performance, long-term job performance, client impact, leadership, employee training, organizational preparedness, employee attitudes and role clarity. Since these factors are instrumental in encouraging G2G services, it is important to ensure that they are strengthened to encourage new users and sustain current adoption maturity level of e-government.

Lastly, this study indicate that e-government is a positive in Dubai public sector and the factors influencing G2G are significant to encourage e-government adoption across all public sector organizations in the UAE and in other countries. The factors are also critical factors that may influence trust in e-government adoption (Belanche et al. 2012; Alzahrani et al. 2017; Lallmahomed, 2017). The findings in this study reveal that 8 factors need to be managed and well understood by all public sector organization to advance e-government maturity level in the country. This implication for theory further supports practical implications of the research results discussed in the next section.

5.4 Recommendations through Practical Implications

Similar to the theoretical implications, this study also has four practical implications. First, the overall findings provide strong overview and knowledge of e-government in

Dubai public sector, factors that influenced the adoption of e-government in departments with good level of e-government maturity in the city. Based on this study and its result, it is important for leadership of each public sector department to create an enabling environment for the 8-factor to be retained as key factors influencing adoption of e-government across Dubai emirates and the entire UAE public sector.

While the it is important to establish support system for the 8-factors identified and researched in this study, the second practice implication of the study result is that balance is required between the 8-factors, attributes of adoption (Rogers, 1995) and five stages of adoption (Kotler & Armstrong, 2003). As explained in chapter two, five attributes; relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995) and five stages; awareness, interest, evaluation, trial and adoption (Kotler & Armstrong, 2003) have all been well researched as integral part of e-government adoption. Therefore, to minimise overdependence on any singular factor, it is recommended to encourage balance and adequate level of resources devoted to facilitate e-government adoption.

Third, practical implication of this study is that public sector employees work in different organisations and departments based on the range of study participants. Organisations and departments have various operations and goals peculiar to their organisation mandate, regardless of the varied goals, the 8-factor are relevant to all department. Therefore, future research should consider application of 8-factor to each organizational objective as this may provide better understanding of how G2G can be uniformly adopted across all public sector organizations. Building on this, other factors may be discovered to mediate the relationship between the 8-factors and e-government adoption. This premise may be investigated in future research to help public sector

organisations determine how best to encourage G2G across public sector in UAE and any public sector organisation in other countries with similar structure to the UAE.

Last practical implication of this study is to empower and encourage team and leaders to create training models that clarify five attributes; relative advantage, compatibility, complexity, trialability and observability by Rogers (1995) and five stages; awareness, interest, evaluation, trial and adoption by Kotler and Armstrong (2003). Benchmarking the 8-factors tested in this study against these attributes and stages may help to strengthen the case for G2G. Therefore, in order to generate sustained G2G, it is recommended for authorities and leadership of each sector to commit to integrating services, thereby increasing usage of e-government services in the public sector.

5.5 Limitations and Suggestions for Future Research

This study proposes a new 8-factor model (figure 5.1) for assessing and understanding e-government adoption in Dubai, UAE and public sector organisations. It has also revealed that certain factors or variables may not moderate the adoption of e-government services in the country. However, like many academic undertakings, the investigation process was not without its challenges and limitations. First, limitation is the literature review where it proved challenging to identify publications on UAE e-government adoption. While some were identified, they were more focused on citizen or public adoption of e-government rather than government to government adoption of e-government as researched in this study.

The literature found were also insufficient for a robust secondary data analysis. This limitation was managed by collecting primary data from several public sector

organisations and department to ensure that the sample size is representative. In terms of methods used, it may be considered a limitation that only survey is used as the data collection instrument. While this may be considered as a threat to validity or / and objectivity, it was managed by recruiting participants from several organisations. This measure helped to generate quality and representative data analysed to derive the empirical results generated in this study.

Despite these limitations, significant contributions to knowledge are made as well as contributions to policy and practice in the UAE as discussed in the previous section. One of the evident contributions is the contribution to the body of knowledge especially allured to in the theoretical implication. As one of the problems that informed this study is limited empirical studies on the study area, this research is now an empirical study that can be referenced and referred to by future researchers. Furthermore, the findings and results are significant contributions to practice if the practical implications are adopted as recommendations.

Above all, it can be concluded that the 8-factor model generated from this study is a major contribution to knowledge and practice. It is therefore recommended to future researcher to further research more influencing factors in the adoption of e-government services in the private sector to determine any variation. A comparative study may also be conducted to determine how different or similar are the influencing factors of e-government services in the UAE public and private sector. Though these suggestions for future research are important and would benefit scholarship, more significant is the need to further investigate moderating factors. Lastly, future studies in the UAE would do well to also consider the use of mixed methods that may prove more beneficial in testing hypotheses as well as confirm the reasons why moderators in UAE public sector differ from those in previous studies elsewhere. Interviews may also be beneficial to

future researchers in understanding the question ‘why’ which is not within the scope of this study.

5.6 Research Conclusion

The UAE is advanced in the use of e-government as acknowledged by several authors who researched on adoption of e-government in the country. As revealed in Table 2.7, e-government studies have become popular in the country in the last five years due to the governments’ commitment to improving its global ranking and raising awareness of benefits of technology. However, this study has been undertaken to further understand the limited use of e-government services within the public sector department despite its adoption by citizens.

This research has also explored the reasons why the political will that motivated the rapid growth and advancement of e-government is yet to generate similar level of traction within the public sector in terms of e-government adoption. These problems informed the research scope and aim which was to identify and critically assess the factors influencing the adoption of e-government in Dubai in order to determine the dominant factors that contribute to successful e-government adoption in Dubai public sector departments.

Despite the challenges experienced with data collection phase, adopting convenience sampling to recruit respondents from various department encouraged participation of more public sector departments including those outside Dubai Emirates. Using online survey as the data collection instrument aided the survey circulation process and the data analysis process. By so doing, it was possible for this study to achieve all four

research objectives set out in Chapter one as critically to achieving the overarching research aim shown in Table 5.1.

Table 5.1 Research Objectives, Methods and Corresponding Results

Objectives	Methods	Result(s)
i. Examine concepts of e-government and its global adoption	Secondary data – literature review	- Four types of E-government exist, namely; G2C (Affisco & Soliman, 2006), G2B (Belanger & Hiller, 2006), G2E (Heeks, 2008) and G2G (Heni et al., 2011) - E-government has four stages of growth (cataloguing, transaction, vertical & horizontal integration) (Layne & Lee, 2001) - Technology adoption has 5 stages (awareness, interest, evaluation trial & adoption) (Kotler & Armstrong, 2003) - Theories of e-government adoption include TAM, TRA, DOI, GAM, UTAUT and 10-factor model
ii. Critically assess factors that influence e-government adoption globally and in the UAE	Secondary data - Literature Review & Primary data – online survey	Globally - Performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention, trust, PU, PEOU were some of the key factors influencing G2C, G2E and G2B e-government adoption. Studies are limited, and almost non-existence on G2G, a gap this research fills. UAE – Performance Expectancy (short-term performance, long-term performance & client impact), Facilitating Conditions (leadership support, employee training & organizational preparedness) and Employee Willingness (attitude & role clarity) were the factors influencing G2G e-government adoption in Dubai

		public sector departments.
iii. Determine and assess presence of the moderating variables that influence e-government adoption in Dubai public sector departments	Primary data via online survey	This objective was achieved through the hypotheses. Demographic variables were found in literature to moderate e-government adoption. In Dubai public sector departments, gender and age were did not moderate the relationship between employee willingness and e-government adoption.
iv. Provide recommendations for enhancing e-government adoption in Dubai and for improving successful e-government adoption in the UAE	Triangulation of findings for objectives i, ii & iii	Three practical and one theoretical recommendation were provided in section 5.4 of this chapter.

As shown in Table 5.1 each objective provides context for the next, and theoretical understanding for e-government adoption in Dubai. While results of this study have shown that 8-factors influence e-government adoption, and led to the development of the 8-factor model, there is no doubt from the discussion and recommendations in this chapter that improvement is needed in Dubai and UAE in general if the global ranking is to improve. Table 2.4 revealed that while gulf region countries like Saudi Arabia, Kuwait and Oman improved on their global ranking of e-government development index, the UAE did not improve its global ranking within the same period. It is therefore hope that the findings of this study are considered, and use to improve G2G e-government adoption in the public sector. While this study has concluded within its defined scope explained at the beginning, it has raised further questions for future researchers, as well as findings that can be adopted by professionals in the field of organizational and public sector studies.

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APPENDIX

Questionnaire Sample

1. eGovernment services will increase the amount of variety in my job
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree

2. eGovernment gives me the opportunity to enhance efficiency in doing my job
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree

3. eGovernment significantly increases the quality of my job
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
4. eGovernment decreases the time required to do my job
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
5. In general, using eGovernment increases the effectiveness of my work
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
6. eGovernment websites are a good source of customer feedback
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
7. eGovernment websites are a very cost-effective way to connect with the community / clients
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
8. I believe eGovernment's website should be the first port-of-call for any

information

- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
9. eGovernment's website should have complete information to avoid unnecessary phone calls
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
10. There should be chat rooms / public forum facilities in eGovernment's website
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
11. The application forms available in eGovernment's website should have electronic submission facilities
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
12. Citizens, residents, businesses and government employees should be able to check availability of my department's services online
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
13. Citizens, residents, businesses and government employees should be able to book / use my department's services online

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

14. People applying for jobs at my department should have access to online application facilities

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

15. Providing option to pay online (for traffic fines, license renewal, process fees, patient fees etc) has improved eGovernment work efficiency

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

16. My department's eGovernment plan is available to me to guide the development of eGovernment

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

17. A specific person (or group) is available for assistance in developing eGovernment in my department

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

18. A specific person (or group) is available for assistance to contribute to the

development of eGovernment in the government

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

19. I have the resources necessary to use/ support eGovernment

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

20. I have the knowledge necessary to use/ support eGovernment

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

21. Training / information sessions are offered periodically by the department to improve my eGovernment skills

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

22. Services offered through eGovernment will increase the level of challenge of my job

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

23. eGovernment is NOT compatible with other application systems I use in my work

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

24. Services offered through eGovernment will increase the level of challenge for my department

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

25. I think eGovernment fits well into my department's work style

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

26. Dubai government's policy strongly supports development of eGovernment services

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

27. There is government funding available for developing eGovernment

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

28. Further changes in organizational structure are necessary to occur to take full advantage of eGovernment

- a. Strongly disagree

- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

29. There is appropriate software supplier support available in my department in developing eGovernment

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

30. There is an appropriate management structure for eGovernment development in this department

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

31. eGovernment assists me in doing my work

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

32. eGovernment is okay for some departments but not the kind of department I work for

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

33. eGovernment is NOT necessary for efficient customer service for the department I work for

- a. Strongly disagree

- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

34. Working with eGovernment services is exciting

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

35. I prefer to work face to face with my clients

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

36. I think the concept of eGovernment fits well with the way I like to work.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

37. I am NOT very sure about how my current duties and responsibilities can play an important role in eGovernment development

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Somewhat agree
- e. Agree
- f. Strongly Agree

38. Considering all different work roles I am engaged in, I am certain about how to contribute to eGovernment development

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree

- d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
39. There is a clear division in my time between regular tasks and for the usage of my department's eGovernment services
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
40. I am very certain about what aspect of my work leads to development of eGovernment in my department
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Somewhat agree
 - e. Agree
 - f. Strongly Agree
41. How old are you?
- a. Between 18 and 29
 - b. Between 30 and 44
 - c. Between 45 and 54
 - d. Above 55
42. You are
- a. Male
 - b. Female
43. What education level/qualification have you attained so far?
- a. High school
 - b. Graduate (diploma, bachelors)
 - c. Postgraduate (masters, phd)
 - d. Other
44. How do you describe your current organizational level?
- a. Top management
 - b. Middle management
 - c. Executive / Administrative
 - d. Other
45. How long have you been working for the government?

- a. Less than a year
- b. 1 to 3 years
- c. 3.1 to 7 years
- d. More than 7 years

46. Have long have you been in your current department?

- a. Less than a year
- b. 1 to 3 years
- c. 3.1 to 7 years
- d. More than 7 years

47. Have you had any formal/ informal training relating to eGovernment/
Information Technology in this department?

- a. Yes
- b. No