THE EFFECT OF SOCIO-CULTURAL NORMS ON THE ADOPTION OF E-GOVERNMENT IN GCC COUNTRIES:

A SAUDI ARABIAN CASE STUDY

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Master of Philosophy

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Abstract

In 2016, Saudi Arabia launched an ambitious development plan intended to reform and revitalise every area of Saudi society. The goals of this plan, known as Saudi Vision 2030, encompass economic diversification, social liberalisation, good governance and civic engagement. The Saudi government hopes that e-government will play a significant role in achieving most of these targets, encouraging civic engagement and distributing the dividends of the new digital economy. Although Saudi Arabia has made significant investments in its Information and Communications Technology infrastructure in recent years, the rate of e-government adoption by Saudi citizens remains persistently low. A large body of literature suggests that the rate of adoption of new technology/innovation is determined by culture. This research draws on findings from existing literature to devise a conceptual framework that encapsulates the socio-cultural factors that may be responsible for influencing rates of e-government adoption in Saudi Arabia.

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List of abbreviations

Abbreviation	Full Designation
ADG	Arab Digital Generation
BI	Behavioural Intention
CSE	Consumer Self Efficacy
DOI	Diffusion of Innovation
EC	European Commission
EGDI	E-Government Development Index
FC	Facilitating Conditions
FM	Femininity
G2B	Government to Business
G2C	Government to Citizens
G2G	Government to Government
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GNI	Gross National. Income
HCI	Human Capital Index
ICT	Information and Communications Technology
ICT4D	Information and Communications Technologies for Development
ID	Individualism
IDI	Information and Communications Technology Development Index
IMF	International Monetary Fund
IQ	Information Quality
ISQ	Information Systems Quality
ITU	International Telecommunication Union
KSA	Kingdom of Saudi Arabia
LTO	Long Term Orientation
MA	Masculinity
MENA	Middle East and North Africa
OSI	Online Service Index
PD	Power Distance
PEU	Perceived Ease of Use
PPP	Purchasing Power Parity
PU	Perceived Usefulness
RA	Relative Advantage
SI	Social Influence
SMEs	Small and Medium Enterprises
TAM	Technology Acceptance Model
TII	Telecommunications Infrastructure Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UA	Uncertainty Avoidance
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs

UNDP	United Nations Development Programme
UNPAN	United Nations Public Administration Network
USA	United States of America
UTAUT	Unified Theory of Acceptance and Use of Technology
WEF	World Economic Forum
WiMAX	Worldwide Interoperability for Microwave Access

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1 Introduction

The member states of the GCC (Gulf Cooperation Council)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE)—have been buffeted by a range of social and economic problems that have grown in seriousness over time (Hvidt, 2013). This moment in time represents a crucial juncture in the history of the Gulf States since they currently face declining oil reserves, a global trend towards renewable energy sources, low and fluctuating oil prices, rising populations, political turmoil, radicalism, religious intolerance and high youth unemployment (Horschig, 2016). This is a toxic socio-economic mix for a region that once dominated the world's main energy supplies and seemed destined to achieve long-term economic success (IMF, 2014).

Efforts to confront these issues have become increasingly frantic with concerted efforts by all the GCC member states to radically reshape the socio-economic landscape (Bokhari, 2017). Oil price volatility has forced GCC countries to implement difficult reforms covering economic diversification, agile and responsive governance, social liberalisation and deficit reduction. A good example of these efforts can be found in the on-going Saudi Vision 2030 (2016) which represents a highly ambitious attempt by the Kingdom of Saudi Arabia (KSA) to redefine the social contract between the Saudi State and its citizens.

One of the themes of Saudi Vision 2030 (2016) is to transform KSA into *"an ambitious nation effectively governed"*. Its mission states:

> *The roles and requirements of government have grown significantly since the Kingdom of Saudi Arabia's founding. Government—any government—needs to evolve and improve continuously, if only to keep pace with rising expectations and new challenges. This requires us to meet high standards of transparency and accountability. We are committed to managing our finances efficiently and effectively, and to creating agile public organisations and to tracking both their own performance and that of the government overall.*

KSA hopes to engage its populace by deepening communication channels between government agencies, citizens and the private sector. It intends to harness the growing power of information and communications technology (ICT) to engage citizens as stakeholders in remaking the country by gaining better insights into, and perspectives about, its citizenry (Shediac et al., 2008). This involves empowering society by reforming the social welfare system to make it more efficient and responsive, redirecting resources towards those most in need, and tailoring these resources to match the care and support requirements of vulnerable individuals and groups. In addition, this will involve offering

training courses to the unemployed so they can be re-skilled, enabling them to play a more positive role in society (Albassam, 2015).

Other stated goals in KSA's drive towards reform include embracing transparency with zero tolerance for corruption, whether administrative or financial, and adopting international administrative practices and standards. To aid this transformation, performance data will be published and made freely available to the public (Horschig, 2016). KSA has rightly recognised e-government as a tool that will help it to achieve these goals of good governance, realising that it must aim to do more with less, and has ambitious goals of becoming a global leader in e-government (Saudi Vision 2030, 2016). UNDESA (2018) asserts that e-government represents a significant tool for achieving the United Nations' 17 sustainable development goals (UN, 2015). UNDESA (2018) posits that the adoption of ICT and e-government can enhance human capital, encourage economic development and prosperity, and combat rising inequality and poverty.

1.1.1 What is e-Government?

For the purposes of this study, the following section will provide a synthesized, working definition on which the study will base its conceptualisation of e-government.

Originally, e-government was defined in fairly simple terms as "*the use of information and communications technologies (ICT) to transform government by making it more accessible, effective and accountable*" (World Bank, 2002). However, in recent years, this definition has now expanded to encompass all aspects of society and governance.

According to the OECD (2014), e-government involves harnessing the transformative power of ICT to enhance public service delivery and decision-making processes in order to achieve greater efficiencies and transparency. It also requires government agencies to re-orient their cultures, adopting a collaborative stance and operating as partners in order to achieve societal goals (Alshehri & Drew, 2010; Ebrahim & Irani, 2005).

E-government or electronic government can also be defined as:

> *The use of ICT in the transformation of government; primarily aiming to the improvement of accessibility, effectiveness and responsibility. It is based on the diffusion of information and information policy development. E-government aims to increase citizens' participation and active citizens' development affecting the mechanisms of democracy* (Spirakis et al., 2010).

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Thus, to synthesize a working definition of e-government taking into consideration the past and present definitions of e-government, the concept on which the thesis will base its analysis is the definition below:

> *e-government is the use of ICT in government leading to a transformation of accessibility, effectiveness, accountability and responsibility. E-government, in using technology to provide online services and automate previously manual activities, can aid in the more effective diffusion of information through making important information and advice readily available to citizens through online platforms. A key aim of e-government is to increase the participation, development and collaborative advancement of societal and democratic goals. E-government requires a collaborative effort to optimize and extend the reach of the mechanisms of electronic governance from all key stakeholders in order to reach its full transformative potential.*

1.1.2. Development of e-government

The opportunities presented by significant digital developments occurring in recent years, including online services, big data, social media or cloud computing, have redefined the way in which we look at e-government. E-government encompasses electronic interactions of three types—government-to-government (G2G); government-to-business (G2B); and government-to-consumer (G2C)—and an ever more versatile and holistic approach is taking shape (Alshehri & Drew, 2010).

Widespread use of ICT is viewed as both vital for economic growth and beneficial for government interaction with citizens. E-Government is also viewed as essential for the development of a country and has led to the creation of the concept of ICT for development (ICT4D) (World Bank, 2013; Njihia & Merali, 2013). Within the Information Systems field, the term ICT4D is used to designate the association between ICTs and development. The advent of ICTs was heralded as a means of reducing or eliminating poverty and accelerating economic development. Governments around the globe have acknowledged the significance of putting in place a telecommunications infrastructure so that the spread of ICTs can occur (Helbig et al., 2005).

E-government innovations help public administrations around the world to be more efficient, and to deliver better services with greater transparency and accountability. E-government can help governments to reduce their carbon footprint, meet emissions targets and ensure effective natural resource management. It also stimulates economic growth and promotes social inclusion of disadvantaged and disenfranchised groups. ICTs have also proven to be effective conduits for knowledge-sharing and skills development (Spirakis et al., 2010).

By exploiting ICT innovations, e-government is able to provide myriad opportunities to transform public administration into a tool for sustainable development; improving healthcare delivery services, reducing costs and facilitating better risk management (Akesson et al., 2008). However, research has also shown that barriers can hinder the adoption of ICT, meaning that some societies may miss out on the opportunities offered by e-government (Selwyn, 2004). Previous studies also indicate that the use of ICTs in government can have spill-over effects on other sectors and this, in turn, enhances productivity and reduces poverty (Walsham & Sahay, 2006). For these reasons, e-government is expected to play a major role in KSA's drive towards economic diversification and good governance.

This is an important area for developing regions, like the GCC, where successful implementation of e-government could lead to increased compliance with international codes and standards, better accountability and reduced corruption (Gregor et al., 2014). Successful e-government can also play a constructive role in important areas such as health and security. However, some 35% of e-Government initiatives in developing countries are considered failures because objectives remained unfulfilled or showed promise but were then abandoned. Another 50% were considered partial failures as a result of missed objectives and adverse results (Heeks, 2003). Thus, ICT, and subsequently, e-government adoption, represents an important issue for the economic and social wellbeing of developing countries (Gregor et al., 2014).

E-government represents a paradigm shift in the way the public sector operates in terms of values, culture and how the government performs its duties and interactions. The Saudi government has already begun the process of enacting its concept of e-government. It has an e-government program known as *"Yesser"*; an umbrella government portal covering all the procedures, legislation and issues related to e-government implementation. It takes its name from the Arabic word '*Yesser*' which means 'to make easy' or 'to simplify' (Al Nagi & Hamdam, 2009). KSA believes in the potential of ICT to simplify and streamline work procedures and to facilitate intra-agency communication as well (Communications and Information Technology Commission, 2015).

Research by AlAwadhi & Morris (2008) carried out in Kuwait studied factors that have an impact on the adoption of e-government services. They concluded that the most significant factors affecting the decision to use these services were social and cultural influences, perceived usefulness, convenience, trust and other demographic factors related to gender, technical competence and the digital divide. Another study on the

same topic conducted in KSA suggested that information security, complexity, availability and culture were the most influential factors (Alateyah, 2013).

Initially, barriers to e-government adoption were considered to be simply technical in nature (often referred to as hard issues). Over the last decade, GCC countries including KSA have invested intensively into creating a world-class ICT infrastructure to overcome potential bottlenecks. For example, according to the Economic Development board of Bahrain (EDB 2019), the total value of the Middle Eastern ICT market was forecast to reach $200bn USB in 2017, and reached $235 bn USB in 2018 (Atradius, 2018). In Bahrain, the EDB (2019) predicts large scale economic growth in the areas of Cloud technology (41% growth per year), Digital content (13% growth per year, reaching $4bn in value by 2020), E-commerce (growing from $20bn to $200bn in value by 2020) and business services (growing to $1.86bn in value by 2021).

Several studies and institutions have pointed to a positive correlation between investments in ICT and an increase in economic growth. For example, according to the Communications and Information Technology Commission (2015), there is an overall increase of 1.21% in GDP value for every 10% increase in broadband penetration rates. KSA not only spent the most on ICT out of all GCC countries in 2014, spending a total of $112bn, but also spent more on investment in ICT than all other GCC countries combined (CITC, 2015). 65% was spent on Telecommunications services, while the remaining 35% was spent on Hardware, Software and IT services. By industry, investment was fairly equally divided (32% other, 25% communications, 20% Public, 12% oil and gas, and 11% finance).

At the same time, the number of internet users has increased exponentially, reaching 19 million users (Communications and Information Technology Commission, 2015). However, the rate of e-government adoption remains relatively low in KSA, when compared to countries with a similar GNI per capita (UNDESA, 2018). This has led many scholars to conclude that the most significant extant barriers to e-government adoption are not factors relating to hard issues but social and cultural influences. These factors are known as soft issues (Heeks, 2003).

The relationship between culture and technology is one of co-determination or co-specification. Whilst changes in technology cause changes in the practices and ideas of a culture, in the same way changes in the characteristics of a culture may trigger changes in technology (Pineda, 2014).

According to Strauss-Howe's generational theory (1991), American culture has noticeably changed with each new generation and each of these generations has been shaped by significant cultural moments. The theory postulates that individuals from different age groupings (what Strauss and Howe (2007) refer to as a generation) experience the same significant cultural moments in different. As each generation comes of age, its emergent cultural perspectives become the dominant culture. Thus, culture changes, each generational culture being distinct from the one preceding it (Strauss & Howe, 2007). The main thrust of their argument was that the best predictor of an individual's personal cultural values within a society is the generation to which they belong.

In conjunction with Google, Sabbagh et al. (2012) undertook a study focusing on what they called the Arab digital generation (ADG) in the aftermath of the Arab spring revolutions. They included in the ADG members of the Middle East and North Africa (MENA) population born between 1977 and 1997. These are internet users between the ages of 21 and 41 who are digitally active, own a laptop, computer or smartphone and access the internet multiple times each day. They are educated, religious yet free-spirited, politically aware, outspoken and are more prone to questioning tradition and its effect on their lives.

Although there are numerous studies about e-government services and e-government adoption, most of them are almost a decade old, dating largely from the early 2000's. These studies can no longer be said to account for the emergent culture in KSA and in the GCC member states at large, nor do they address the rapid pace of technological change and its effect on culture. Thus, these studies have lost their relevance and their premises cannot be readily translated to the changing face of GCC countries like KSA. A systematic literature review of existing research relating to models of technology adoption will be undertaken in this dissertation, and the effects of socio-cultural factors on technology adoption will be explored to produce the basis for a conceptual model for the adoption of ICT technologies and e-government services in KSA. In particular, this research seeks to identify those socio-cultural factors that may act as barriers to e-government adoption in KSA.

1.2 Research Aim

The primary aim of this study is to uncover the information leading to understand the effect of socio-cultural norms on e-government adoption in KSA, and to produce a framework to identify how these socio-cultural norms may affect Saudi citizens' use of e-government services.

1.3 Research Questions

This research addresses two questions:

- What is the current level of ICT in KSA?
- What are the socio-cultural norms that may affect e-government adoption in GCC countries especially KSA?

1.4 Research Objectives

This study has three objectives:

- To carry out a systematic literature review of the existing research on e-government adoption, the technology adoption models underpinning these studies, and their findings.
- To identify the cultural factors that are considered to affect e-government adoption in KSA.
- To develop an e-government adoption framework that encapsulates the socio-cultural norms in KSA.

1.5 Thesis Outline

This thesis will cover the following areas through the research process:

2. Background Literature

    This section will review the research on the subject of implementing and adopting models of technology, current e-government practices and their effectiveness will be considered, and the obstacles to adoption of technology will be summarised. Finally, the findings will be drawn together in order to generate and derive the most appropriate solutions to these obstacles with reference to KSA specifically.

3. Methodology

    The systematic literature review, which forms a major part of the methodology for this thesis, aims to develop an extensive list of the most recent published and unpublished studies relating to the adoption of e-government in developing countries such as KSA, by using a systematic literature review methodology which will establish, critically evaluate and unify the wide variety of literature on the subject.

4. Results

   This section will outline the results of the systematic literature review, representing the data in tables that can be quantitatively analysed and generate a macro perspective on the subject of technology adoption in KSA. A collection of 40 articles and their features will be aggregated and presented.

5. Production of Conceptual e-government Adoption Model

   This section will outline the production of a conceptual e-government adoption model as generated by the results in the preceding chapter, then will go on to explain the implications, limitations and advantages of the model.
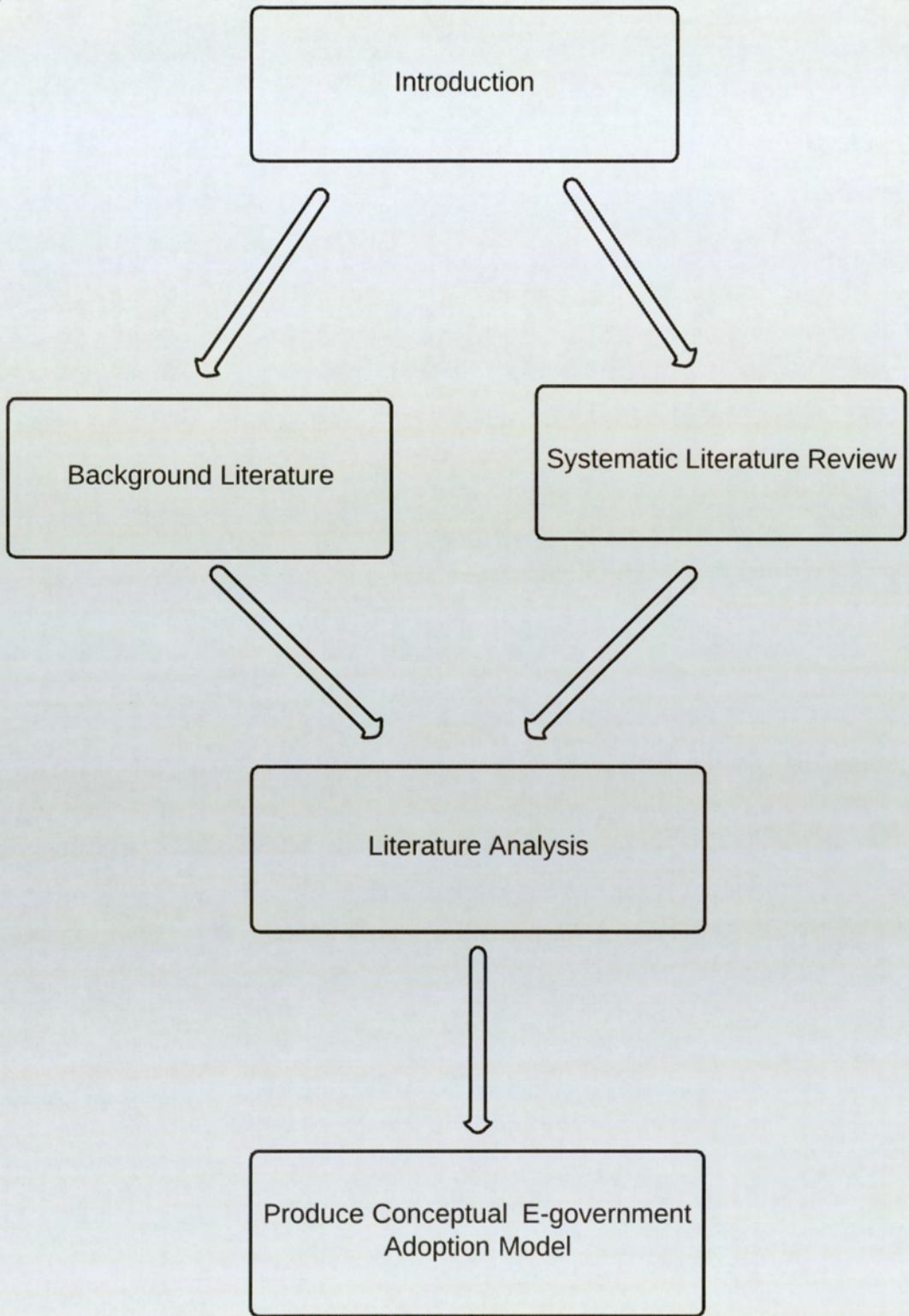
Figure 1.1: Depiction of the research process

2 Background

This dissertation aims to explore the status of e-government in the GCC countries with an emphasis on KSA as a case study.

Current advances in technology have prompted governments across the globe and especially those in the Middle East to take advantage of the potential of e-government in order to improve how the public sector operates. In the case of the GCC countries, this will require a radical overhaul of existing social norms and the redefinition of government interaction with its citizenry, effectively rewriting the social contract and enfranchisement as envisaged in the Saudi Vision 2030 (2016) mission statements.

This research will extensively review the extant literature (2014-2018), examining those studies focusing on the implementation and adoption of models of technology. Current practices affecting e-government services will also be taken into consideration together with any obstacles to implementation and findings linked to e-government adoption.

The themes gleaned from the literature review will be extensively explored and discussed in terms of their potential links to the case of KSA. The challenges that may affect the adoption and implementation of e-government in KSA will be considered with the aim of deriving the most appropriate solutions.

2.1 Digital Revolution

> *ICT encompasses all technical equipment and facilities that convert, process, save and transfer various types of information in digital form. It includes voice telephony, data communications and computer, radio, television and similar technologies* (BMZ, 2013).

There has been a global explosion of ICT during the last decade. Between 2005 and 2015, it is estimated that the number of internet users has grown from one billion to nearly four billion users (ITU, 2017a; World Bank, 2016). Eight out of every 10 people in the developing world own a mobile phone; even in Sub-Saharan Africa, that number is 73%. To put the ubiquity of ICT in an even more startling context, there are now more people with mobile phones in the developing world than people who have access to clean water and electricity (World Bank, 2016). The year 2018 marked a significant milestone; ITU predicted that in 2018 half the world's population would have access to the internet (ITU, 2018), a threshold that was reached and declared at the end of 2018 (ITU, 2018).

a. ICT access by population

Total global population
~7.4 billion

Within mobile coverage **7** billion

Mobile phones **5.2** billion

Total internet users **3.2** billion

High-speed internet **1.1** billion
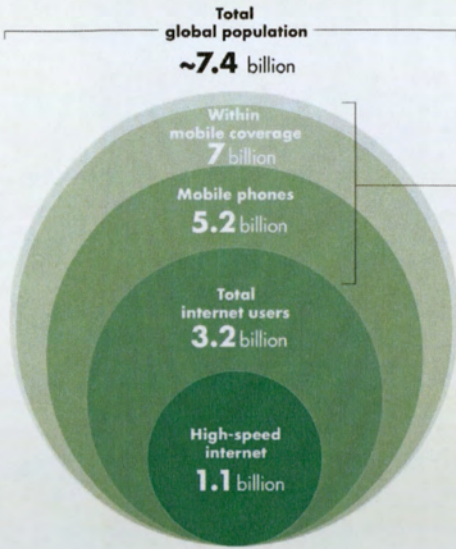
b. A closer look at the world's offline population

Congo, Dem. Rep. 68 million
Mexico 70 million
Ethiopia 95 million
Brazil 98 million
Nigeria 111 million
Bangladesh 148 million
Pakistan 165 million
Indonesia 213 million

Philippines 63 million
Russian Federation 55 million
Iran, Islamic Rep. 54 million
Myanmar 53 million
Vietnam 52 million
United States 51 million
Tanzania 49 million
Thailand 48 million
Egypt, Arab Rep. 42 million
Turkey 41 million

China 755 million

India 1.063 billion

Total internet users **3.2** billion

Countries outside of the top 20

High-speed internet **1.1** billion

Figure 2.1: Overview of global access to ICT
Source: World Bank (2016)

2.2 Digital Dividends

The benefits of the digital revolution are visible for all to see: easier communication and access to information; faster and more efficient service delivery; free digital products and the creation of new industries and new forms of leisure (BMZ, 2013; ITU, 2017a; World Bank, 2016). Furthermore, studies by the International Telecommunication Union (ITU, 2018) and Wu (2018) show that all 17 of the UN's sustainable development goals (UNDP, 2015) can be achieved by harnessing the power and ingenuity of ICT.

Figure 2.2: UN Sustainable Development Goals 2030
Source: UNDP (2016)

2.2.1 ICT fosters inclusion

Issues of social, economic and political exclusion have begun to receive increasing levels of attention lately due to rising inequality (UNDP, 2016; World Inequality Database, 2018). ICT is able to solve this problem in versatile and ingenious ways that can cater for local social needs. Traditionally, one of the barriers to transactional activity has been identified as information asymmetry—meaning that one side is disadvantaged with respect to access and availability of information—and its effect on quality decision-making and trust (Akerlof, 1970). In the past information, access to information could be an expensive and onerous process; however, the advent of free search engines (such as Google or Bing) and the rise of e-commerce (with companies such as Amazon, Alibaba, etc.) have levelled out information asymmetry distortions and capitalised on the demise of this phenomena as well (World Bank, 2016).

Moreover, social media has given people all over the world a platform they can use to amplify their voice and be heard. Freely associating with like-minded individuals allows people to mobilise themselves and create coherent organised actions (Ghannam, 2011). it could be argued that movements like Occupy Wall Street and London, and the Arab Spring, were the manifestation of smart mobs and the next social revolution, leveraging ICT for social change and freer expression, as predicted by Rheingold (2002).

2.2.2 ICT increases efficiency

The dramatic drop in the price of ICT has made it possible for businesses to find ever greater profit margins and offer more efficient services. Replacing human labour and non-ICT factors with ICT capital helps to reduce overhead costs and human error. The initial outlay of setting up an ICT system for a business is quite expensive, however, the cost of scaling up after the initial outlay tends towards zero (World Bank, 2016). Adding an extra user or customer or processing an extra payment incurs no marginal cost.

Industries that have managed to leverage this feature of ICT have been remarkably successful. Airlines are able to sell plane tickets online, supermarkets use automated check-out machines and manufacturers have access to real-time inventory and supply chain management systems (BMZ, 2013; ITU, 2017a). Systems of this type are accessible at all times and require no human involvement at all.

Another useful feature of ICT is its ability to amplify human capital, by providing tools that allow for a greater expression of these skills (UNDP, 2016; WEF, 2017). The factors that are not replaced by ICT are further augmented, for instance, managers are able to monitor worker productivity better (World Bank, 2016), a coach processing sports analytics data on digital equipment can devise better coaching methods and game-winning strategies (Davenport, 2014), or provide a platform for collaborative work and multi-disciplinary problem solving (Wu, 2018).
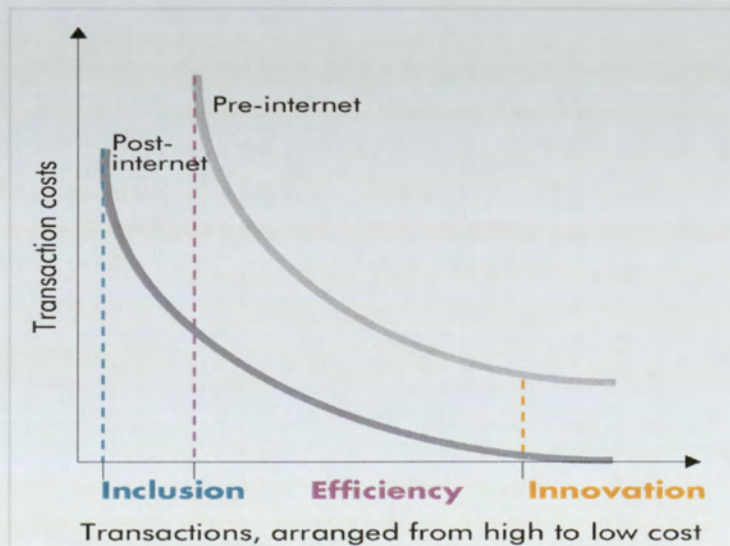
Figure 2.3: How ICT delivers dividends
Source: (World Bank, 2016)

2.2.3 ICT engenders innovation

The unique features of ICT and the opportunities it offers have also enabled the rise of the so-called sharing economy which has helped to create new industries and disrupt existing ones. Well-known examples include Airbnb (hospitality), Uber (transportation), and Spotify and Netflix (entertainment) (PwC, 2014; Schneider, 2017). The creative destruction of these industries offers great returns for investors and cost-effective services for consumers that are also of high quality (Schneider, 2017).

It has always been considered difficult to monetise creativity and people-centric activities. Traditionally, scaling up creative endeavours has produced a bottleneck in terms of income generation. ICT offers a number of innovative solutions to these issues. Now, a photographer or an artist can licence out the same copyrighted piece of work a million times over to potential buyers all over the world, generating huge sums of money and income for the creator (WEF, 2015). Platforms like GoFundMe and Patreon allow content creators to be paid via crowd-funding efforts using online payment processing, depending largely on the largesse of consumers. Other platforms such as YouTube also offer free content, but creators are paid by sharing the proceeds of advertising revenue, since their content draws in a captive audience that provides an opportunity for marketing other products (PwC, 2015; WEF, 2015).

2.3 Unintended consequences

There is, however, an obverse to the positive effects of ICT on society. The considerable power of ICT facilitates great returns for the winners in the digital economy it has created but effectively leaves those who have not harnessed ICT dividends behind (Eswaran, 2017). This can lead to economic stratification, social exclusion for individuals and the potential rise of industrial monopolies (World Bank, 2016).

Furthermore, ICT and the subsequent rise of the digital economy generates a massive volume of data on a daily basis. This has inspired new ways of using data for nefarious purposes like election rigging (Shorey & Howard, 2016), censorship and control (King et al., 2013).

The digitalisation of infrastructure and services can leave entities vulnerable to cyber-security threats, disruption of services, breaches of privacy and data security issues (UNDESA, 2018). In 2017, the so-called "WannaCry" cyber virus wreaked economic havoc on the United Kingdom's National Health Service, costing an estimated $100 million as a result of 6,912 appointments being cancelled in one week. This not only

disrupted the delivery of health services but also endangered the health of patients (National Audit Office, 2018).
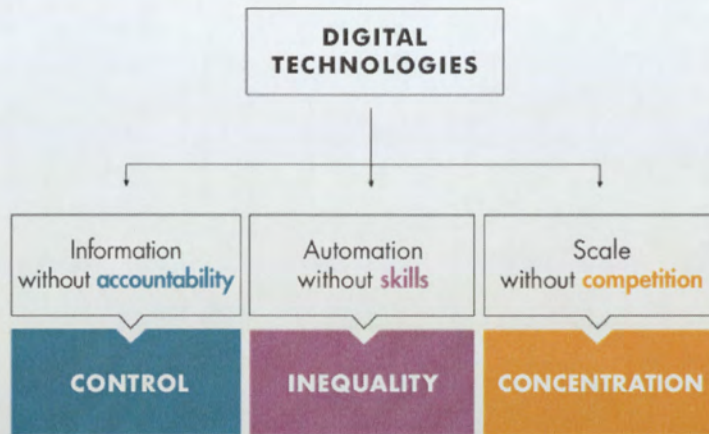
Figure 2.4 Negative unintended consequences of ICT
Source: World Bank (2016)

2.4 Digital divide between individuals

When the dividends of ICT are unevenly distributed between different individuals, this can produce social polarisation and extreme labour stratification. This inequality can cause many social ills and economic problems. Outcomes can include unemployment, increased rates of crime, a rise in radicalism, inequality in income and health together with diminished life expectancy, all of which act as an obstacle to achieving universal human development goals (UNDP, 2016).

2.4.1 Gender

There are 250 million fewer women than men online. Recent research suggests this gap is actually expanding because males are adopting ICT and the internet at a faster rate than females (ITU, 2018). Men are more likely to use ICT and the internet than women in two-thirds of the countries across the globe. According to the International telecommunications Union, the overall proportion of women using the internet is 12% lower than for men (ITU, 2017). This data presented by ITU is based on the total number of male/female users online as presented as a percentage of the male/female population of a country. However, it is not always possible to tell gender from an online profile, as identity is easily hidden online, and therefore this data is not necessarily an 100% accurate representation of the overall gender statistics of online internet use. Nevertheless, if the evidence presented by the ITU is correct, this gender divide will exacerbate the existing problem of gender inequality. Men will continue to benefit

disproportionally from ICT. Women's voices will be drowned out while men's voices will become amplified (ITU, 2017a; UNDP, 2016; OECD, 2018).
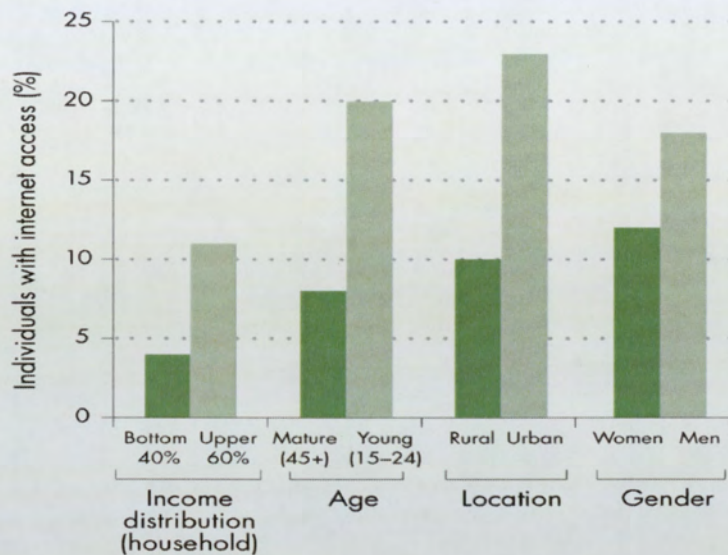
Figure 2.5 ICT usage disparity in African households
Source: World Bank (2016)

In addition, the range of ICT use is narrower for women (Haight et al., 2014), women have lower reported self-efficacy (Hargittai, 2003), and their usage tends to be less frequent and intense (Wasserman, 2005).

2.4.2   Age

Several studies show that younger people are more likely to adopt ICT and learn the new skills required to enjoy the full potential of ICT. This is a trend that is reflected globally (Wu, 2015; UNDESA, 2018). Another reason is that younger people are more likely to be "digital natives" (Prensky, 2000a), that is individuals for whom the use of ICT has become an integral part of their culture (Pineda, 2014).

2.4.3   Geography

Geography also plays a huge part in the digital divide, especially with regards to access and quality of access (ITU, 2017a). Studies have suggested that landlocked countries have lower ICT and internet adoption rates than coastal ones, a trend that is especially noticeable in developing countries and those with a lower population. The price of

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internet bandwidth is higher for landlocked countries (World Bank, 2016; UNDESA, 2018).

2.4.4 Household Income

Households with higher incomes have greater access to ICT and internet (ITU, 2017a), as do those which tend to live in urban areas (UNDP, 2016) where there is better quality of infrastructure and affordability is greater (UNDESA, 2018).

2.5 Digital divide between countries

The digital divide is a manifestation of differential ICT development within and between countries. According to World Bank (2016) estimates, some 60% of the world's population are offline. ICT development is captured by the ICT development index (IDI). This composite data draws upon 11 indicators measuring ICT access, use and skills, allowing ICT development comparisons to be made across countries and over time (ITU, 2017a) (see section 2.5.3 for further information).

2.5.1 Human Capital
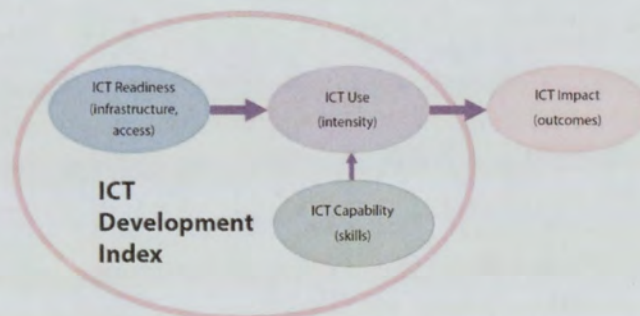
Figure 2.6 Stages of evolution towards an information society
Source: ITU (2017a)

Human capital is one of the most important determinants of a country's long term success (ITU, 2018; UNDP, 2016). It refers to the knowledge and skills people possess that enable them to be value creators and contributors to the global economic system (WEF, 2017). Using the Human Capital Index (HCI), the World Economic Forum (WEF) ranks various countries on how successfully they are developing human capital. It does this by making use of four thematic dimensions (capacity, deployment, development and know how) across four generational age groups (0-14, 13-24, 25-54 and 56-64). With respect to these four dimensions, capacity reflects the existing educational standards across generations, deployment quantifies the accumulation and application of skills through work, development captures the nation's efforts to educate, skill and up-skill students and the working age population, while finally, know how represents the continuum of

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specialised skills use at work. The WEF awards scores using a grading scheme in which 0 equals worst and 100 equals best.

The latest HCI report (WEF, 2017) makes some startling observations. It notes that only 62% of the global human capital has been developed and that only 25 countries of the 130 studied had developed 70% or more of their human capital. Some 14 countries were found to have developed less than 50% of their human capital.

2.5.2   Human capital in the GCC

Table 2.1 shows a collation by the International Telecommunication Union of the latest HCI data available at the time of writing for the GCC member states with the exception of Oman which was not included in the original WEF (2017) study. According to this report, 41.48% of KSA human capital remains undeveloped compared with 44% for the MENA countries as a whole. This is a huge chunk of human potential that remains untapped.

Country	Overall Index		Capacity Sub-index		Deployment Sub-index		Development Sub-index		Know-how Sub-index	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
UAE	65.48	45	60.36	91	64.91	69	75.82	19	60.84	32
Bahrain	64.98	47	76.31	30	67.85	45	61.91	77	53.87	53
Qatar	63.97	55	58.67	94	78.50	10	67.45	52	51.25	69
KSA	58.52	82	70.56	60	47.70	124	63.23	71	52.60	58
Kuwait	56.08	96	49.41	105	67.44	50	55.66	94	51.80	66

Table 2.1 Human Capital Index in the GCC (excluding Oman) and the constituent sub-indices
Source: ITU (2017a)

2.5.3   ICT Development

The IDI was developed by the International Telecommunications Union in 2008 (ITU, 2017a). It is a composite index consisting of 11 indicators that are amalgamated to create a benchmark measure allowing comparisons of ICT development to be made across countries over time using a grading curve of 0 being worst and 10 being the ideal. The IDI is based on three constituent sub-indices (ITU, 2017a).

The access sub-index reflects ICT readiness and it uses five different indicators of infrastructure and access. These are fixed-telephone subscriptions, mobile-cellular telephone subscriptions, international internet bandwidth per internet user, households with a computer, and households with internet access (ITU, 2017a).

The second sub-index, use, is intended to capture ICT intensity and usage by drawing on three indicators, namely, individuals using the internet, fixed-broadband subscriptions and mobile- broadband subscriptions (ITU, 2017a).

Finally, the skills sub-index represents the skills that the population possesses that are relevant to ICTs. This consists of three indicators which are the average number of years of schooling, gross enrolment in secondary education, and in the tertiary sector). This is intended to measure human capital. The skills sub-index is less heavily weighted than the other three (ITU, 2017a).

KEY INDICATORS

Total population (1,000s)	32,276
GDP per capita (US$, PPP)	50,458
Mean years of education (years)	8.1
Median age of population (years)	29.8
Healthy life expectancy (years)	64.4
Working age population (1,000s)	23,013
Labour force participation rate (%)	54.0
Unemployment rate (%)	5.6
Youth not in employment, education or training rate (%)	16.1
Output per worker (US$, PPP)	136,180
Mean monthly earnings (US$, PPP)	3,483
Mean monthly earnings for high-skilled workers (US$, PPP)	5,995
Mean monthly earnings for medium-skilled workers (US$, PPP)	-
Mean monthly earnings for low-skilled workers (US$, PPP)	-
Public spending on education (% of GDP)	5.1
Public spending on social security, working age (% of GDP)	-
Public spending on social security, retired (% of GDP)	-
Pension scheme coverage share (% of working age pop)	26.2

Table 2.2 Key HCI indicators for KSA
Source: ITU (2017b)

The average IDI score has gone up by 0.18 points in the period from 2016 to 2017, mostly due to improvements in the ICT use sub-index. However, the gap between the best performing countries and the worst performing ones has widened to 8.02 points (ITU, 2017b).

2.5.4   Affluence

An internet user is 22 times more likely to be from a high-income country than a low-income one. The prevalence of mobile phones is 29 times greater in high-income countries and the comparative cost of internet services is 150 times most costly in low-

income countries. All these indicators reveal the stark differences in the digital divide between countries (UNDESA, 2016; WEF, 2016).

Key indicators for Saudi Arabia (2016)		Arab States	World
Fixed-telephone sub. per 100 inhab.	12.0	7.7	13.6
Mobile-cellular sub. per 100 inhab.	157.6	107.1	101.5
Fixed-broadband sub. per 100 inhab.	10.8	4.7	12.4
Active mobile-broadband sub. per 100 inhab.	78.5	45.2	52.2
3G coverage (% of population)	97.2	81.9	85.0
LTE/WiMAX coverage (% of population)	88.0	33.8	66.5
Mobile-cellular prices (% GNI pc)	0.7	4.3	5.2
Fixed-broadband prices (% GNI pc)	1.1	10.1	13.9
Mobile-broadband prices 500 MB (% GNI pc)	1.0	4.5	3.7
Mobile-broadband prices 1 GB (% GNI pc)	0.6	5.5	6.8
Percentage of households with computer	69.0	43.3	46.6
Percentage of households with Internet access	94.6	45.3	51.5
Percentage of individuals using the Internet	73.8	41.8	45.9
Int. Internet bandwidth per Internet user (kbit/s)	78.2	39.0	74.5

Table 2.3 ICT development indicators in KSA
Source: ITU (2017b)

The most affluent countries, measured on a GNI[1] per capita basis, also have the highest IDI scores (ITU, 2017a). With only a few exceptions there is a correlation between affluence and IDI scores (ITU, 2017b). However, causation is not clearly proven, and it is hard to disambiguate between ICT and affluence cause and effect (Yates et al., 2010; Korpela et al., 2003).

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[1] According to the World Bank (2018) *"GNI per capita (formerly GNP per capita) is the gross national income, converted to US dollars using the World Bank Atlas method, divided by the mid-year population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. GNI, calculated in national currency, is usually converted to US dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate actually applied in international transactions."*
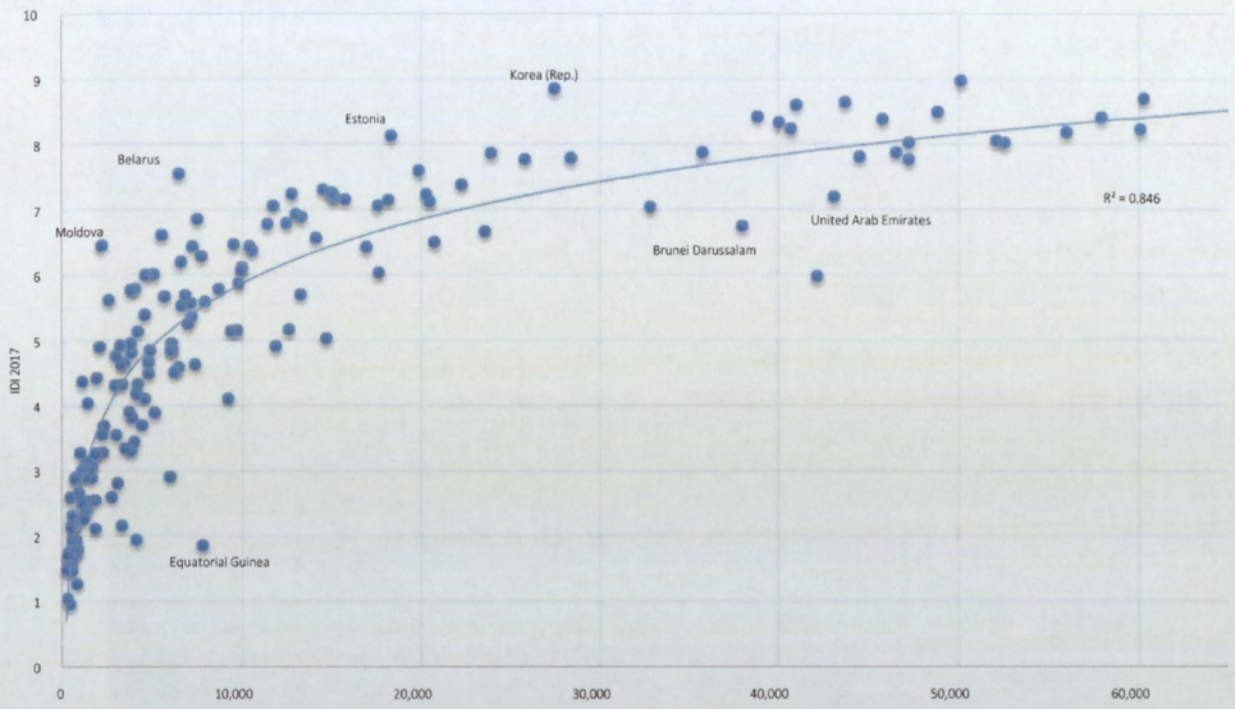
Figure 2.7 Correlation of IDI and GNI per Capita

Economy	Regional rank 2017	Global rank 2017	IDI 2017	Regional rank 2016	Global rank 2016	IDI 2016	Global rank change 2017-2016	Regional rank change 2017-2016
Bahrain	1	31	7.60	1	30	7.46	-1	0
Qatar	2	39	7.21	3	36	7.12	-3	1
United Arab Emirates	3	40	7.21	2	34	7.18	-6	-1
Saudi Arabia	4	54	6.67	4	45	6.87	-9	0
Oman	5	62	6.43	5	64	6.14	2	0
Lebanon	6	64	6.30	6	65	6.09	1	0
Jordan	7	70	6.00	7	66	5.97	-4	0
Kuwait	8	71	5.98	8	70	5.75	-1	0
Tunisia	9	99	4.82	9	95	4.70	-4	0
Morocco	10	100	4.77	10	98	4.57	-2	0
Algeria	11	102	4.67	12	106	4.32	4	1
Egypt	12	103	4.63	11	104	4.44	1	-1
Libya	13	115	4.11	13	112	3.93	-3	0
Palestine	14	123	3.55	14	122	3.42	-1	0
Syria	15	126	3.34	15	124	3.32	-2	0
Sudan	16	145	2.55	16	141	2.56	-4	0
Mauritania	17	151	2.26	17	152	2.08	1	0
Djibouti	18	158	1.98	18	161	1.80	3	0
Comoros	19	164	1.82	19	162	1.78	-2	0
Average			4.84			4.71		

Table 2.4 IDI scores and sub-indices for Arab States
Source: ITU (2017b)

Kuwait, UAE and KSA underperform on the IDI score considering their high GNI per capita, relatively speaking. The GCC as a region also presents the same pattern. Most of the discrepancy can be explained by data found in the use and access sub-indices (ITU, 2017a; ITU, 2017b).

Country	GNI Per Capita (USD) 2016	IDI	Ranking 2017
Czech Republic	18,160	7.16	43
Estonia	18,190	8.14	17
Cyprus	23,719	7.77	28
Slovenia	22,000	7.38	33
Portugal	19,820	7.13	44
KSA	20,080	6.67	54

Table 2.5: IDI Score comparison of countries with similar GNI per capita to KSA
Source: (World Bank, 2018; ITU, 2017a)

2.6 E-government

The benefits of ICT adoption by businesses and individuals are apparent; however, when governments harness the power of ICT and the internet, they are not only able to deliver better services, but also to cut costs. This can also play a part in negating the unintended exclusionary consequences of ICT application (ITU, 2018; Wirtz & Daiser, 2015, pp. 2-10).

E-government has the potential to support the implementation of the UN's 17 sustainable development goals that form the core of its 2030 Agenda (Wu, 2018). This states that:

> *the spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy* (UN, 2015).

E-government has great potential for delivering better public services in a very efficient manner. Potentially, it allows governments to be more responsive to the changing needs of its citizenry. It can help to deliver high quality service at a lower cost, whilst at the same time tackling thorny issues such as corruption and ineptitude (Ebrahim & Irani, 2005). When it is implemented properly, e-government increases access to government and power to vulnerable groups within society. Enhancing the transparency of government processes encourages a more engaged citizenry, thus creating a more cohesive society, good governance and a better quality of life (ITU, 2018).

E-government has been growing over the last 17 years, and since 2014, 193 governments now provide an online presence. According to the United Nations Public Administration Network (2016), there has been a large positive global trend in increasing levels of e-government in recent years, and according to the E-Government Development Index (EDGI), which is based on 3 major fundamental components including online service provision, connectivity of telecommunications, and human capacity, with the top 3 countries leading in this respect being the UK, Australia, and the Republic of Korea. The UNPAN (2015) also notes that increasing levels of e-government will help countries achieve better transparency in policies, greater insights into the success, failure or progress of political initiatives, and a greater level of interconnectivity and unification in online systems being connected to one centralized platform, making government functions and services more streamlined.

2.6.1 Types of E-Government

2.6.1.1 Government-to-citizen (G2C)

Most government services can be categorised under this type of e-government, which involves the provision of electronic resources to citizens and other stakeholders in order to broaden the channels of communication with them. This facilitates a continuous dialogue with the government, expands access and fosters active citizen participation in public life. As a result, a culture of transparency is facilitated and governments can be more easily held accountable (Ndou, 2004).

A good example of this sort of service can be provided by "*Aadhaar*", an e-government service introduced by the Aadhaar Act in India under the aegis of the National Institution for Transforming India. This is a biometric identity system that now covers 90% of the population, meaning that for the first time, a large number of the population have been recognised in the system by the government as a result of this digital identity (UNDP, 2016). This allows the government to more accurately diagnose the problems affecting citizens and the scale of these. It also facilitates the design of smart social programs, that target the neediest, allowing efficient allocation of resources to those areas where they are likely to have the greatest impact (UNDP, 2016).

2.6.1.2 Government-to-business (G2B)

G2B is the second most popular type of e-government, offering significant advantages to both parties involved. This covers the various communications between government and businesses, and services that government offers. It can take the form of a one-stop shop providing access to information and services. Typically it allows a business to download or fill out application forms online, pay taxes, lodge complaints, tender contract bids, renew licenses and permits, etc (Wirtz & Daiser, 2015). In this way, it reduces the burden on businesses and lowers the barriers to entry in many industrial sectors. This encourages the growth of business, especially the small and medium enterprises (SMEs) that are so vital to economic growth and diversification (Pascual, 2003).

2.6.1.3 Government-to-government (G2G)

G2G covers the relationship and communications between government organisations, departments and agencies. ICT-enabled communication facilitates smooth and seamless co-operation between different government entities. It helps to engender synergy in resources, information, skills and capabilities for the purposes of delivering

cost effective and quality services to the public. It can be used to streamline processes and end the duplication of services (Ndou, 2004).

2.6.1.4 Government-to-employee (G2E)

G2E is the least studied sector of e-government. Some researchers consider it to be part of the G2G sector while others deal with it as a separate sector of e- government (Riley, 2001). This involves the application of ICT to human resource management for public sector employees. It allows exchange of information between workers, covers administrative activities such as booking holidays, and giving and receiving government/employee feedback to maintain a harmonious relationship (Ndou, 2004).

2.6.2 E-government participation (e-participation)

UNPAN (2018) defines e-participation as *"the use of online services to facilitate provision of information by governments to citizens ('e-information sharing'), interaction with stakeholders ('e-consultation'), and engagement in decision-making processes ('e-decision making')"*.

E-government must not be thought of as merely the automation of old practices. It is the creative use of ICT in relation to the procedures and culture of government and can not only bring about greater effectiveness but also promote civic participation (World Bank, 2002).

E-participation can be described as the diffusion of e-government throughout a society. Adoption of e-government by citizens and other stakeholders is necessary to unleash its full potential (UNDESA, 2018). E-government is also expected to play a major role in achieving the 17 objectives of the UN's 2030 social development goals (UNDP, 2015; UNDP, 2016; ITU, 2018).

According to the World Bank (2002) and UNDESA (2018) there are three levels of e-government participation and these move progressively from "passive" towards "active" engagement (UNDESA, 2016).

2.6.2.1 E-information

Governments create vast amounts of information that can be of significant use to individuals and businesses. The internet and ICT make transmission of this information seamless across multiple channels ensuring that it reaches the biggest audience possible (World Bank, 2002).

Availability of useful and quality information can help to reduce information asymmetry and it allows citizen recipients of this information to make better and informed decisions. Ultimately, it enhances transparency, and thus serves to engender greater trust in government (UNDESA, 2018).

2.6.2.2 E-consultation

This stage of e-participation requires two-way communication between the government and the involved stakeholders. It can take the form of feedback requests from the government on particular issues, for example, surveys on policy matters. This allows policymakers to engage the citizenry in helping to shape new laws and regulations (World Bank, 2002; UNDESA, 2016).

Finland has an e-government service that is underpinned by this philosophy. Finnish citizens can visit the website www.demokratia.fi to give their opinions on any government policy. The Finnish government solicits opinions on all manner of things and citizens can put forward policy suggestions and even request government responses to matters of concern to citizens. These interactions are not legally binding but advisory (European Commission, 2016).

2.6.2.3 E-decision making

E-decision making allows citizens to make legally binding pronouncements on different issues. It makes the running of government a true partnership between the government and those it governs. It promotes civic engagement and gives the populace a voice. It is an exercise in ICT-enabled direct democracy (World Bank, 2002; UNDESA, 2016).

A good example of e-decision making is e-voting. The government of Estonia has offered its citizens the option of remote electronic voting in national elections since 2005. The Estonian government is heavily reliant on the internet to deliver services to its citizens. The downside of this, however, is that it leaves the government open to cyber attacks or illegal coercion with regards to e-voting (Heiberg & Willemson, 2014).

2.6.3 E-participation index (EPI)

Country	EPI Score	Global Ranking 2018	Global Ranking 2016
UAE	0.9438	17	32
Bahrain	0.7978	53	32

Oman	0.6846	63	66
Qatar	0.7135	67	55
KSA	0.7135	67	39
Kuwait	0.691	72	55

Table 2.6 EPI scores and rankings for GCC countries
Source: UNDESA (2018)

UNDESA (2018) published empirical data representing the e-government development index (EGDI) for 193 countries. The EGDI is a weighted average of normalised scores made up of three composite sub-indices. These are the online service index (OSI) which measures the scope and quality of online services; the, telecommunications infrastructure index (TII), and the human capital index (HCI) (WEF, 2017) which measures the skills that citizens possess to create value in the global economy.

Each of the composite sub-index composite values is normalised between the range of 0-1, and the resultant EGDI is obtained by taking the arithmetical average of the three component indices. The EGDI scores are then grouped under four headings labeled as very high (0.75 – 1), high (0.5 – 0.75), middle (0.25 – 0.5) and low (0 – 0.25).

The average global EGDI score has increased from 0.47 to 0.55. In the 2018 report, some 40 countries achieved a very high score compared to only 10 countries in 2003. Of specific relevance here is the fact that KSA has dropped eight places in the ranking (UNDESA, 2018) despite continued investment in ICT by the government (Communications and Information Technology Commission, 2015).

Distribution of 2018 vs 2016 EGDI index scores across income groups
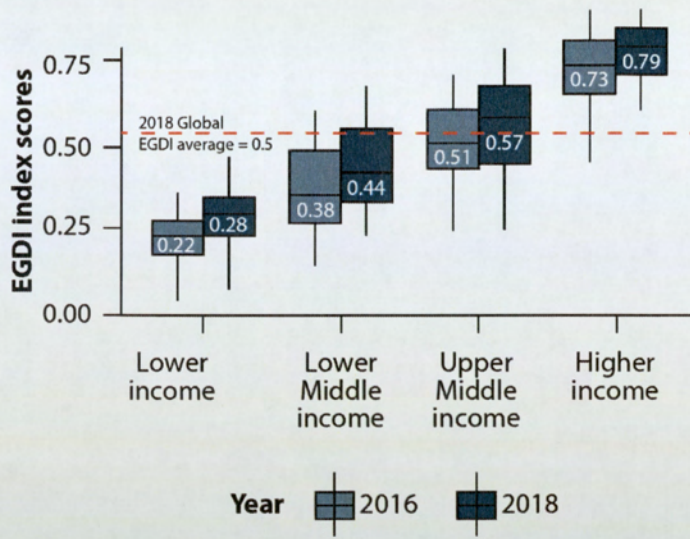
*Figure 2.8 EGDI Score distribution across national income groups
Source: UNDESA (2018)*

GCC State	Ranking (2018)	Ranking (2016)	Rank Change	EGDI	OSI	TII	HCI	Income Level	EGDI Group
UAE	21	29	+8	0.8295	0.6877	0.8564	0.8295	High	Very High
Bahrain	26	24	-2	0.8116	0.7986	0.8466	0.7897	High	Very High
Kuwait	41	40	-1	0.7388	0.7917	0.7394	0.6852	High	High
Qatar	51	48	-3	0.7132	0.7917	0.6797	0.6683	High	High
KSA	52	44	-8	0.7119	0.7917	0.5339	0.8101	High	High
Oman	63	66	+3	0.6846	0.8125	0.5399	0.7013	High	High

Table 2.7: EGDI scores in the GCC
Source: UNDESA (2018)

Country	GDP (US $) (Millions)	OSI	TII	HCI	EGDI	Ranking (2017)	Income Level
KSA	683827.1443	0.7917	0.5339	0.8101	0.7119	52	High
Switzerland	678887.3368	0.8472	0.866	0.8428	0.852	15	High
Argentina	637590.4193	0.75	0.8579	0.5927	0.7335	43	Upper Middle
Sweden	538040.4582	0.9444	0.9366	0.7835	0.8882	5	High

Table 2.8: Countries with similar GDP to KSA and their E-government development markers
Source: World Bank (2018); UNDESA (2018)

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The number of internet users increased from just 13% in 2005 to approximately 63.7% by the end of 2014, an estimated 19.6 million internet users (CITC, 2015). However, relatively low levels of adoption of e-government services still persist (Al-Hujran et al., 2015; Alateyah, 2013).

The same ICT can produce widely divergent results in different nations and cultures (Heeks, 1998). Specifically, a strong social determinant of the success of e-government projects is the acceptance of the initiative by government officials. In Cameroon, for example, attempts to use e-government to improve transparency and efficiency were undermined by the refusal of government employees to use the system (Heeks, 2005). The success of ICT-enabled initiatives as an anti-corruption strategy depends on issues of implementation, education, and culture, to name but a few (UNDESA, 2018).

A study by Subramanyam et al. (2016) showed that the rate of adoption varies across countries regardless of income levels. Thus, the rate of ICT adoption is closely related to national cultures (Erumban & De Jong, 2006).

Researchers have posited that the willingness of individuals to use e-government services is influenced by other non-technology related factors and increasing interest has begun to be paid to socio-cultural norms.

2.7 Culture

Kroeber and Kluckhohn (1952, p. 181) defined culture as consisting of

> patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiment in artefacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other, as conditional elements of future action.

Hofstede (1991, p.5) posits that culture is "*the collective programming of the mind which distinguishes the members of one group or category of people from another*". There is no one all-encompassing definition of culture, however, Kroeber and Kluckhohn's (1952) definition represents a good attempt at capturing the full breadth of the phenomenon.
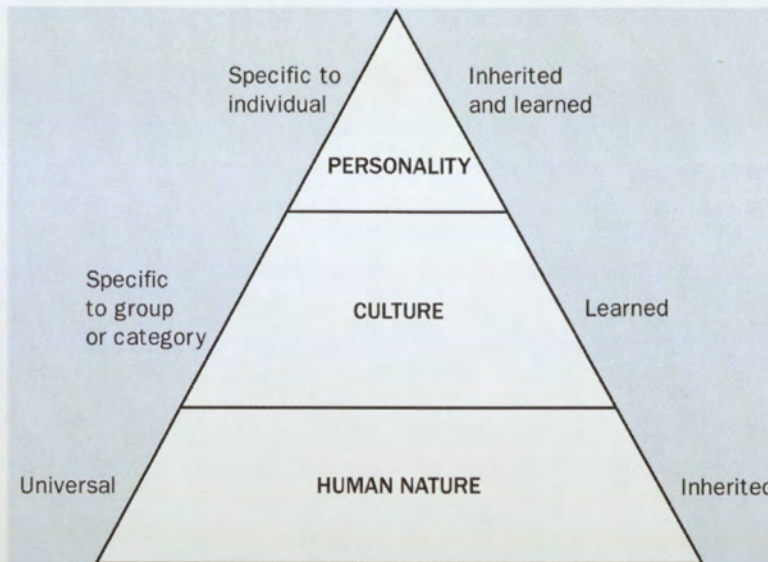
Figure 2.9: Development of culture and identity
Source: Hofstede et al. (2010)

2.7.1   Human nature

It has been argued that there is a universality within the human condition, a generalised framework from which all cultures grow. At its most basic, this relates to our ability to feel fear or pain, and to undertake social learning. From an evolutionary science perspective, culture can be considered an adaptive system. It derives from our biological nature and genetic lineage as biological entities and finds its expression ecologically over time. Thus, culture is evoked by physical and material realities (Norenzayan, 2005). Scholars have considered the common underlying framework for many languages as evidence of a genetic underpinning of the language facility; a universal grammar that is innate and encoded in the language acquisition faculty (Chomsky, 1995, pp. 131-153).

There are universal truisms that all societies and communities must contend with, including the sexual dimorphism of humans, reproduction, infant helplessness, differential physical capacities, satisfaction of our carnal desires, hunger, security and shelter, and sex (Kluckhohn, 1962, pp.317-18). The answers to these challenges vary across geography and time, thus leading to cultural variability. These answers emerge because of natural selection, somewhat analogous to Darwinian biological evolution; culture exhibits variation, selectivity and inheritance (Tomasello et al., 2005). Nature is constantly evolving and so is culture (Norenzayan, 2005).

2.7.2   Cultural transmission

Culture emerges when it is passed from one generation to another not genetically but through social mechanisms like imitation, mimicry and instruction (Tomasello et al.,

2005). Thus, the knowledge, customs and cumulative experience is passed on and ensure the continuity of the culture; a survival adaptation (Noranzayan, 2005). Humans are the only existing species capable of social observation and emulation learning (Tomasello, 2000). Humans do not just copy the acts itself, but the strategies that belie the goal and intention (Tomasello, 2000). This biological adaptation allows for the cumulative evolution of culture, giving rise to material and symbolic artefacts including language, art, and technology that require continual modification over time. This creates knowledge that it is impossible to obtain individually (Boyd & Richardson, 1993). Cultural transmission plays a role in the codification of values such as risk aversion, persistence of tradition, altruism, religion etc (Verdier & Bisin, 2008).

The works of Lev Vygotsky and Jean Piaget on cognitive development emphasise the importance of social interaction using tools (pencils, computers, hammers etc.) and signs (language, pretend play, calculus, etc.) and their link to learning and origination of intellect (Ivic, 2000). Cultural artefacts are passed to the next generation then subsumed and integrated into the individual's mental structure (Lourenço, 2012).

2.7.3 Identity

Identities are the traits and characteristics, social relations, roles, and social group memberships that define who one is. Identities can be focused on the past—what used to be true of one—, the present—what is true of one now—, or the future—the person one expects or wishes to become, the person one feels obligated to try to become, or the person one fears one may become. Identities are orienting, they provide a meaning-making lens and focus one's attention on some but not other features of the immediate context (Daphne et al., 2012).

In the book *Software of the Mind,* Hofstede et al. (2010) consider the individual's identity as the combination of their genetic, psychological inheritance and the learned iterative adaptation to transmitted culture. These two variables give rise to a self-identity; thus identity is a manifestation of biological inheritance and learned cultural artefacts. Identity, according to Erikson and Erikson (1998), is the central development task of adolescence.

2.7.4 Generational values

There have been many studies concerning generational cohorts and their values (Inglehart, 1997; Strauss & Howe, 2007) and also some scepticism concerning this view as well (France & Roberts, 2015; Purhonen, 2015).

The "cohort effect" is an observed phenomenon. This term is used in social and human sciences to refer to the influence of being born and raised in a particular time and environment which are shared by other members of the group. The shared experiences

make that group of people distinct from any other group (Santrock, 1998 cited in Simoes & Gouveia, 2008).

Generation cohorts are societal subcultures. It is argued that their values reflect the significant, political, socio-cultural and economic developments that transpired during the pre-adult years of the generation (Strauss & Howe, 1991; Thau & Heflin, 1997). Thus, an individual coming of age in a time of socio-economic and physical insecurity is likely to promote modernist survival values such as economic determinism, materialism, conformity and respect for authority. However, growing up in a time of economic abundance and peace might be expected to evoke postmodernist values like egalitarianism, individualism, interpersonal trust, tolerance of diversity and self-transcendence (Inglehart, 1997).

Inglehart's theory of generational values has two hypotheses about how cohorts develop their values. The socialisation hypothesis posits that values reflect the social-economic conditions of one's childhood and adolescence (Meglino and Ravlin, 1998). The scarcity hypothesis asserts that an adult's most significant subjective value will be based on the socio-economic environmental aspects that were lacking during a generation's youth (Meglino and Ravlin, 1998).

However, life cycle development theory insists that these values change throughout life. It suggests that as people age, they tend to become more collectivist, conservative and self-transcendent. They are also less individualistic, and less open to change and self-enhancing (Erikson & Erikson, 1998).

2.8 Technology and Culture

Technology is a product of and an emergent property of cumulative cultural evolution (Noranzayan, 2005). Pineda (2014) asserts that there are no technology-free cultures and that there is a co-determination relationship between culture and technology. Separating the two would necessitate unravelling human cultures themselves. A society's culture is a determinant of the level of technological development they achieve (Urevbu, 1997).

Claxton (1999) insists that technology is not culture-neutral but is representative of cultural values and accumulated knowledge. Transferring technology often means transferring the ideas and artefacts of the culture in which it originated. Thus, technology transfer can only be successful if it is properly integrated into the existing structures of the recipient culture.

Technology has compressed the time and space dimensions of culture (Bauman, 2000). This is particularly true thanks to the ubiquity of ICT and the internet. As Giddens (2000, p. 19) noted: "Place is nowhere and everywhere." The pervasiveness of contemporary technology has thus altered previous physical and cognitive barriers, meaning that local cultures are constantly exposed to outside influences (Bauman & Tester, 2001). The pace of technology is also so fast that traditional institutions struggle to adapt and only transience is durable, a phenomenon Bauman referred to as "liquid modernity" (Bauman & Tester, 2001).

Many consider the effects of technology to be negative, worrying that it diminishes local customs and represents a form of cultural imperialism (Bauman, 2000). However, others argue that the inevitable transfer of culture that comes with technology does not lead to the destruction of the distinctiveness of cultures but creates new cultures that are hybrids of the two (Appadurai, 2017). Indigenisation can also occur in which aspects of an incoming culture are assimilated into the recipient culture, in the same way that musical genres can be reimagined with a local flavour (Daud & Zain, 2001).

Technology also plays a role in cognitive development. Subramanyam et al. (2006) argue that the internet has become a tool of identity. It is a platform which allows for experimentation and exploration of different identities, which is vital for adolescent development. it also shapes political attitudes and youth culture.

Many researchers have argued that the diffusion of technology across cultures occurs in a highly culture-specific manner (Al-Gahtani, 2007; Erumban & De Jong, 2006). Gefen et al. (2003) posited that these differences in technology diffusion are due to the strong relation between culture and technology acceptance.

2.9   The Millenials: A New Generation of Digital Natives

In 2001, across two published papers, Marc Prensky hypothesised about the existence of what he referred to as "digital natives" i.e. generational cohorts who have come of age at a time when technology proliferated in every sphere of society. They are therefore so fully immersed in technology, that using this is akin to being a native speaker of a language (Prensky, 2001a). He argued that millennials (those who were born between 1981-1997) represented the first digital natives, since they came of age when ICT and the internet were ubiquitous. He designated members of the older generations as "digital immigrants" (Gregor et al., 2014), likening them to visiting members from the "old country", who learn the new language to differing levels of competence. He asserts that

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digital natives not only have a higher affinity for technology but use technology in far more varied ways than previous generations (Prensky, 2001a).

Prensky (2001a; 2001b) argues that the plasticity of the brain means that this unprecedented exposure to technology has re-shaped and fundamentally altered the brain of digital natives. In short, they think differently. Digital Natives are accustomed to receiving information very quickly and they like parallel processing information and multi-tasking. They have a marked preference for graphical rather than textual information and prefer to access data in a random fashion.

Research on millennials suggests that they are more worried about work/life balance, and expect more support and appreciation from organisations they are involved in (Ipsos MORI, 2010). In addition, they have a tolerance for difference, believe in diversity, and constantly question the status quo (Frey, 2018). Millennials are also open to change and use social media as a tool of political activism (PewResearch, 2010). They are politically aware, educated and tend towards postmodernist values (Frey, 2018).

However, millennials are not the same everywhere, although they do share a large number of similar character traits due to technology and the widespread use of social media. Local tendencies still play an important part in the individual identities of millennials globally (PwC, 2013).

2.9.1   The Arab Digital Generation

A new generation is also emerging in the MENA region. Born between 1977 and 1997, this demographic encompasses 40% of the MENA population. A substantial number of them are very active online and on social networks. They are the Arab Digital Generation (ADG). They were first studied in the aftermath of the Arab spring revolutions (Sabbagh et al., 2012). This group makes up almost 70% of the Saudi population, due to the Kingdom's high birth rate (CIA, 2018).

The ADG represents the most dynamic population sector within the GCC members. They are highly educated, tech-savvy, economically empowered and open to change, politically aware but still religious (Sabbagh et al., 2012). Although this group shares many similarities with their global millennial cohorts, MENA youth are influenced by both Islamic and contemporary culture. The ADG are the first digital natives in the MENA region, and they represent a distinct emergent culture and it is likely this group will drive the changes now sweeping across the region (Sabbagh et al., 2012).

Where useful in this research, references will be made to the ADG to highlight the ways in which they diverge from technological and cultural trends in the wider population.

2.10 Cultural Theories

2.10.1 Values theory

According to Schwartz (1992), human values are "*desirable, trans-situational goals, varying in importance, that serve as guiding principles in people's lives*". He derived these values from the needs of individuals as biological entities, the pragmatic societal requirement for co-operation and the overarching need for group support and survival (Schwartz, 1992). He claimed that the values that he had collated were a comprehensive set of etic cultural dimensions that encompassed those of Hofstede as well (Schwartz, 1992).

Schwartz (1992) argued that individual values often centre around two fundamental dimensions: conservation vs. openness to change and self-transcendence vs. self-enhancement. In order to pursue these values, individuals have to make trade-offs by prioritising one over the other. He distilled these dimensions into 10 individual values (Schwartz & Bardi, 2001, p. 270).

Individual Values	
Power	This value concerns one's position in the socioeconomic hierarchy, prestige and access to resources and political power. It is about having the tools to impose one's will and dominate.
Achievement	This varies from culture to culture, but centres on an individual meeting and even demonstrably excelling the levels of competence as societally defined.
Hedonism	The individual pursuit of pleasure and carnal gratification.
Stimulation	Seeking new frontiers, escapism, new stimuli and thrills.
Self-Direction	Free will, sovereignty of the individual and a right to choose how one lives
Universalism	Appreciation for diversity, tolerance, equal rights for all and protection for nature.
Benevolence	Preservation of the common good, and promoting the welfare of those around oneself
Tradition	Respect for and observation of customs and norms that culture/religion imposes on the individual
Conformity	Subjugation of desires and impulses that may endanger others or go against societal expectations.
Security	Harmony of the individual, the society they reside in and relationships they participate in.

Table 2.9 Individual Values

Schwartz (1992) also argued that some values are manifested on a cultural level, representing the solutions utilised by different cultures to tackle the same universal human problems. He narrowed these down to three dimensions: embeddedness vs. autonomy, hierarchy vs. egalitarianism, and mastery vs. harmony (Schwartz & Bilsky, 1987). In turn, these dimensions were distilled into seven cultural values (Schwartz, 1992).

Cultural Values	
Conservatism	Putting greater emphasis on order and social cohesion, tradition and maintenance of status quo. An aversion to sudden and drastic changes.
Intellectual Autonomy	Welcoming and encouraging diversity of thought, ideas and perspectives. Individuals are free to forge their own intellectual paths.
Affective autonomy	Respecting individual autonomy, allowing individuals freedom to pursue whatever interests they desire, however hedonistic, within the legal framework of society.
Hierarchy	Enforces clearly defined roles of individuals and institutions and also tends to affect resource allocation as well.
Mastery	Prizes competence, allows competition and unequal rewards as a result.
Egalitarian commitment	Promotes the common good over narrow self-interest.
Harmony	Places a premium on living as one with nature.

Table 2.10 Cultural Values

2.10.2 Cultural theory of risk

Risk encompasses the probability and the consequences of the occurrence of an event and it can be objective or perceived (Adams, 1995). Individuals differ in which aspect of risk they focus on: probability or consequence (Drottz-Sjöberg, 1991). Objective risk is one that is independent of one's knowledge and fears of the origin of said risk (Ulleberg & Rundmo, 1996). In certain circumstances, perceived risk constitutes objective risk, especially when risks are known (Sjöberg, 1998).

Cultural theory attempts to answer questions about how people perceive and respond to the world around them and asserts that this is shaped by social interaction and culture at large. The basis of cultural theory is the grid-group typology developed by Mary Douglas (Douglas, 1978 cited in Oltedal, 2004). According to Douglas, variation in social participation can be adequately accounted for by the dynamics between the two dimensions: group and grid.

Figure 2.10: Illustration of Mary Douglas' group/grid postulation
Source: Oltedal, 2004: p.22

Douglas (1978 cited in Oltedal, 2004) further stated that the perception of risk is not determined by personality characteristics, needs, choices, or features of the risk objects. Instead, what defines acceptable risk is an operation of an individual's cultural learning and social conditioning. She identifies four worldviews or ways of life that in her opinion help to explain risk perception. She labels these individualistic, egalitarian, hierarchical, and fatalistic, and they display a sequence of risk perception that is self-preserving. In other words, we see situations which place our worldview or lifestyle as threats or as risks.

As shown in Figure 2.10, an individualist viewpoint can be identified by the way in which the system characterises people in terms of low group and grid. While egalitarians exist as part of the upper tier group and the lower grid, upper grid combined with upper tier group membership equals a hierarchical worldview and system, while a society which defines people in terms of the upper grid versus low group equates to a fatalistic worldview. (Oltedal, 2004: p.18).

2.10.2.1 Individualists

Individualists fear situations, events or people which might obstruct their personal freedom. The ultimate obstacle is war, where certain people are physically controlled by others. Individualists are prone to see risk as an opportunity provided it does not limit freedom (Oltedal, 2004: p.18).

The ADG population can be said to fall broadly under this criterion, since 63 percent expressed a wish for the freedom to act and express themselves freely with the exception of participating in behaviour that causes harm to others. In addition, 37 percent report the fact that they openly articulate their points of view without fearing the results (Sabbagh et al., 2012).

2.10.2.2 Egalitarians

Egalitarians tend to be fearful of developments that may increase the level of inequality among people. They maintain a healthy scepticism regarding designated experts, strong institutions and the potential of misused authority. This makes egalitarians wary of new technologies that might alter the existing homeostatic processes (Oltedal, 2004: p.19).

2.10.2.3 Hierarchical cultures

In hierarchical cultures, there is an emphasis on the status quo within society and on maintaining such structure. Those living within hierarchical structures demonstrate an intrinsic fear of social disharmony, protests, and crime (Oltedal, 2004: p.20). Saudi Arabian culture is characterised by hierarchical structures, unequal relations and large disparities of power, due to the influence of *wasta* (Aldossari & Robertson, 2016). *Wasta* is a pervasive part of Saudi Arabian culture that will be discussed in detail at the end of this chapter.

2.10.2.4 Fatalists

The fatalist would rather be unaware of danger, since they assume this is unavoidable anyway. Generally speaking, 'fatalism' involves taking an approach of wilfully overlooking the existence of issues that may seem insurmountable or impossible to influence (Oltedal, 2004: p.20).

Islam has an effect on everything in Saudi Arabian society from public to private life (Hutchings et al. 2010). Commitment to Islam percolates throughout the practices and conventions of business (Aldossari & Robertson, 2016). A common Islamic refrain is "*Inshallah*" or "God Willing". This idiom refers to the notion that one's destiny is written by god. It is suggested that this imbues Islamic culture with a fatalistic view that can curtail the motivation to progress towards ambitions (Acevedo, 2008).

2.10.3 Theory of Cultural Dimensions

Hofstede's (2010) theory of cultural dimensions postulated that variations between ideals and beliefs can affect the ways in which individuals connect with one another and relate to their surroundings. Furthermore, Erumban & De Jong (2006) concluded that societal aspects may be a partial influence on the rate of adoption of technology between countries.

A dimension in this context refers to an area of a culture which can be measured and analysed with respect to another culture. Hofstede defines culture as a function of five

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dimensions or dichotomies: Power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, and time horizon (Hofstede, 2011).

2.10.3.1 Uncertainty Avoidance

Uncertainty Avoidance (UA), must be distinguished from risk avoidance, and refers to the extent to which a society is capable of tolerating uncertainty. UA signifies the degree to which a society conditions its members to experience the feeling of either contentment or unease in disorganised circumstances. These unstructured situations refer to situations which are unfamiliar, new, unexplored or simply unusual for an individual. UA cultures aim to minimise the risk of being exposed to these types of situations through the use of rigorous behavioural codes, principles and regulations, condemnation of aberrant ideas, and a deference to the 'absolute Truth' (Hofstede et al., 2010).

Cultures with high UA demonstrate a low level of social trust, tend to take only calculated risks and resist change and innovation and vice versa (Bagchi et al., 2004). Low trust can represent a barrier to e-government adoption (Alzahrani et al., 2017).

2.10.3.2 Power Distance

Power Distance (PD) refers to the question of how far the less powerful members of organisations and institutions (including the family) acknowledge and expect the unequal distribution of power. This represents inequality as observed from the bottom of the hierarchy. It suggests that a society's inherent balance of inequality is endorsed by the followers as much as it is upheld by the societal leaders. Power distribution and inequality of opportunity and outcome are ostensibly fundamental characteristics of any society. While every society displays some form of inequality, some may exhibit higher levels of inequality compared to others (Hofstede et al., 2010). Furthermore, cultures with high PD have a lower affinity for embracing new ideas which impairs decision making. New ideas entail decision-making where no historical precedent exists (Lee & Peterson, 2000). GCC countries have a relatively high PD (Hofstede et al., 2010).

2.10.3.3 Individualism

When referring to a societal rather than an individual characteristic, individualism (ID) as distinguished from collectivism, refers to the extent to which members of a society are assimilated into groups. In individualist cultures connections between people are loose: each individual is held to the expectations of attending to one's own needs as well as those of one's close family members (Hofstede et al., 2010).

Cultures with a high ID score have been shown to possess a higher rate of technology adoption when compared to countries with a low ID score (Erumban & De Jong, 2006). Saudi Arabian culture is highly collectivist and places emphasis on the group rather than individuals (Ajami, 2016). The ADG is more skewed towards ID relative to the larger population (Sabbagh et al., 2012).

2.10.3.4 Masculinity–Femininity

Again when referring to a societal as opposed to an individual characteristic, the Masculinity (MA)-Femininity (FM) dimension is defined as the distribution of values between genders. Hofstede's IBM research conducted in 1998 showed that the values of women differed less across societies when compared to men. The studies found that the values of men, when compared between countries, ranged from very similar to women's values (modesty, empathy) to very different to women's values (assertiveness and competitiveness). Hofstede labelled one pole (assertive, competitive) 'masculine' and the other 'feminine' (modesty, empathy). Women in countries leaning more towards the feminine pole share similar modest, caring values to the men. In countries leaning towards the masculine pole, however, women exhibit assertiveness and competitiveness to some extent, although this behaviour is not as overt as it is in the men. As such, there is a disconnect between the values of men and women in these countries (Hofstede et al., 2010). Erumban & De Jong (2006) concluded that the higher a country's MA score is, the higher its rate of ICT adoption when compared to countries with a low MA score. Arab cultures have a high MA score (Hofstede et al., 2010).

2.10.3.5 Time orientation

Hofstede's fifth dimension is associated with cultural time orientation. Cultures characterised by long term time orientation (LTO) correlate with themes of prudence and determination, whereas cultures characterised by a short term time orientation are instead identified by the themes of adherence to traditions, achieving societal duties, and the preservation of individual honour. Due to the fact that innovation refers to the expectation of rewards in the future as opposed to maintaining tradition, cultures with a high LTO score tend to demonstrate a higher rate of ICT adoption when compared to countries with a low LTO score (Erumban & De Jong, 2006). Arab-Islamic culture has a low LTO and is past-oriented, placing great emphasis on preserving tradition (Ajami, 2016).

Hofstede's theory has been criticised due to the fact that it diminishes a culture to the point that it is merely a group of principles, as well as the fact that it neglects the degree to which national cultures have over time changed to be more adaptable as they 'traverse

national borders and co-mingle due to interaction and interdependency' (Earley, 2009, in Harbi et al., 2017, p. 2793). McSweeney (2002) went further, rejecting Hofstede's model outright. He questioned whether empirical evidence supports the existence of average national cultures, arguing that individualism and collectivism can exist side-by-side.

2.11 Specific Features of Arab culture

2.11.1 Wasta

Wasta can be broadly defined as connections, influence or nepotism. A *wasta* is someone who is a middleman (Cunningham & Sarayrah, 1994). Although a lack of literature on the subject of the impact of *wasta* exists, it has been defined in the past as the action of intervening in support of another person and drawing out favours or resources from a third party. It is very reliant on networks, whereby arbitrary advantage can be gained by leveraging connections with high status individuals (Cunningham & Sarayrah, 1994; Hutchings & Weir, 2006).

According to Mellahi (2006, p.115-121), Saudi Arabian society can be classed as collectivist, and the management style of the culture is more group-focused than it is individualistic. A strong shared concept of morality and duty underpins organisational values and goals of developing solidarity.

According to Al-Harbi et. al, 'this can result in hierarchical and unequal relations and large disparities in power' (2017:6). Subordinates also show deference and compliance to their superiors, and seldom challenge their authority or choices (Aldossari & Robertson, 2015). The most common style of management is authoritarian (Branine & Pollard, 2010).

The Arab concept of *wasta* when translated means 'going in-between' (Smith et al., 2008, p.3). This underlines the vital contribution of the process of mediation to Arab culture, and has a fundamental and defining impact on personal connections (Smith et al., 2008, p. 3). Productivity and progress are achieved through relationships that are defined as *Wasta* (Branine & Pollard, 2010; p. 16). Its importance to Arab culture can not be understated, and it takes on a central and fundamental role in Arab life in terms of making decisions, sharing knowledge and opportunity creation (Hutchings & Weir, 2006).

2.11.2 Identity and Language

Arab-Islamic culture displays several fundamental and distinguishing features, for example being 'past-oriented and high-context' (Ajami, 2014:120). In the mid-1970s, an

American anthropologist named Edward T. Hall studied cultures and separated them into their communication methods: high-context cultures, in which the majority of information is implicit, and low-context cultures, in which almost all information conveyed is explicit.

Words in Arab-Islamic culture have multiple meanings and implications, resulting in a system of communication whereby the specific meaning of a word or phrase is predominantly derived from context. Arabic is also high-context insofar as the majority of Arabs assume that conversational partners or audiences are already aware of the relevant background information. As such, when communicating, elaboration is rare, which results in the majority of Arab Muslims using generic remarks and phrases rather than using specific, precise arguments and statements (Hall and Hall, 1990).

Furthermore, Arab-Islamic culture is abstract-oriented. For example, the identity of the Arabs resides in the Arabic language. However, languages are abstract; that which we speak and write are simply representations of reality. Most Arabs are Muslim but some are Christians. They have different skin tones and have different origins. The only unifying denominator is Arabic. Thus Arab identity is fundamentally tied up in the language itself, since it confers membership of this group. Yet, the Arabic language is abstract, just as every language is, and so too is the identity of Arabs (Alsohaibani, 2016).

Identical logic follows in the religious perspective. The perception of most Muslims is that they are a part of a single geographical Islamic nation. Yet, when looking at a world map, it is difficult to pinpoint one 'Islamic nation', as this is largely dispersed across several Muslim countries. This Islamic nation is therefore a social and psychological construct which is formulated and conceptualised within the minds of Muslims. As such, the Arab-Islamic culture is also abstract-oriented in this way (Ajami, 2016; Alsohaibani, 2016).

2.11.3 Arab values

According to Ajami, 'Eastern cultures are collectivistic while Western cultures are individualistic' (Ajami 2004: 121). The majority of Muslims self-identify in terms of their social groups, for example families, meaning that these groups are where their loyalties lie – it is in this sense that Arab-Islamic culture takes on collectivistic characteristics (Hofstede et al., 2010).

Eastern cultures also have high PD, meaning that most Arab Muslims display a behavioural and attitudinal pattern of acceptance and respect towards imbalanced power distribution and will seldom challenge or dispute the status quo in terms of the power hierarchy. Arab-Islamic culture is also characterised by risk avoidance, which can be seen in the fact that the majority of Arab Muslims will tend towards the avoidance of risks,

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often being distressed by uncertainty (Hofstede et al., 2010). With respect to these cultural features, it can be concluded that on the whole, Arab Muslims perceive change to be a negative and threatening phenomenon, and will show a preference for incremental improvement over innovation. The reason for this is down to an overall cultural aversion to uncertainty (Lewis, 2005).

2.12 Technology Adoption Models

Several studies have revealed that technology adoption is not simply connected to technology but also to wider systems of attitude and personality (Venkatesh et al., 2012), social influence (Fishbein & Ajzen, 1975), and trust (Gefen et al., 2003) in addition to several other expediting factors (Thompson et al., 1991). It is necessary to understand the evolution of this research area in Information Systems and look at future research opportunities.

The terms 'adoption' and 'diffusion' are used interchangeably in many studies although they are quite distinct from each other. Adoption refers to selection of a technology when employed by either a business or organization (Carr, 1999), whereas the expression 'diffusion' refers to the spread of a particular technology to a wider audience and user base (Rogers, 2003). As such, whereas the phrase 'adoption' refers to technology usage on an individual level, the term 'diffusion' is a phrase that refers to the adoption of technology by the wider public (Sharma & Mishra, 2014).

2.12.1 Diffusion of Innovation Theory (Rogers, 1962)

The study of diffusion goes as far back as to the research of Everett Rogers, who developed the Diffusion of Innovation theory in the 1960s. Since this ground-breaking research was conducted, it has been widely accepted by the research community. The predominant concept behind this idea is that there are four key elements which have an impact on the advancement of a new idea; innovation, communication channels, time and social systems. Rogers identified five phases to the development of diffusion, namely, knowledge, persuasion, decision, implementation, and confirmation. He also categorised six types of users: innovators, early adopters, early majority, late majority, laggards and leap-froggers.
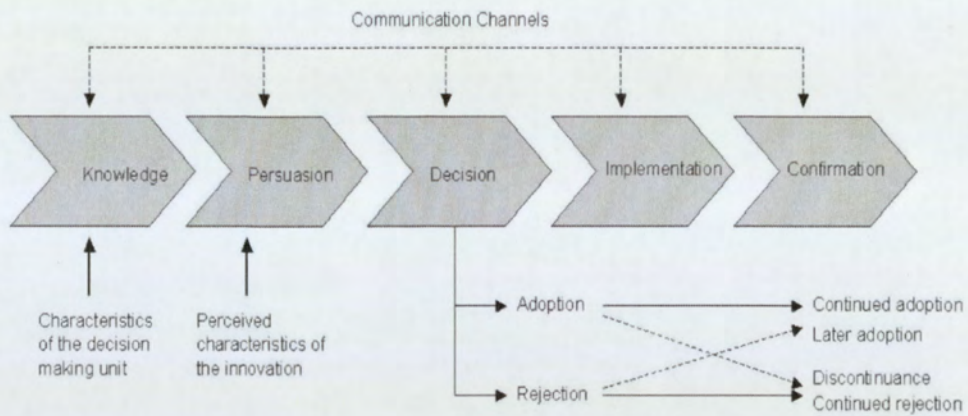
Figure 2.11: Diffusion of Innovation Theory
Source: Sharma & Mishra (2014)

Diffusion of innovation theory laid the groundwork for the conception of the S-shaped adoption curve, which is also referred to as the epidemic model of adoption. According to this concept, the constellation and mapping of the development and advancement of a new concept or approach can be compared to the spread of infections among a population. Following this metaphor, at first the pace of advancement is slow. When the graph reaches the mid-range, the rate of spread accelerates, then eventually abates, which results in an S-shaped curve (Rogers,1962).
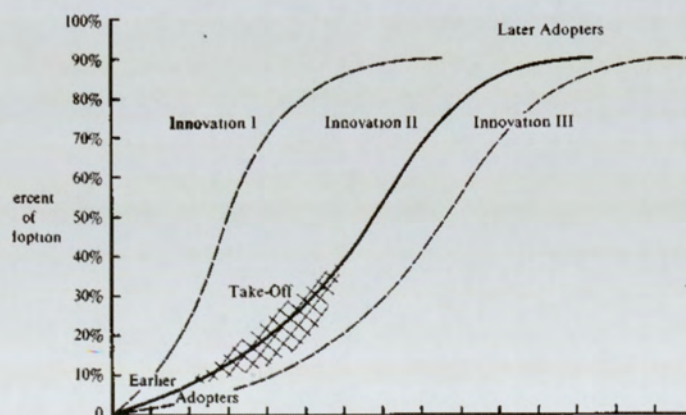
Figure 2.12: Technology adoption S-graph
Source: Rogers (1962, p. 11)

2.12.2 Theory of Reasoned Action

Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA) relies on three constructs: behavioural intention, attitude, and subjective norm. This theory proposes that an individuals' behavioural intention is dependent on their attitude and subjective norms. Furthermore, BI can be transformed into action if the intention impulse towards a particular behaviour is sufficiently strong.
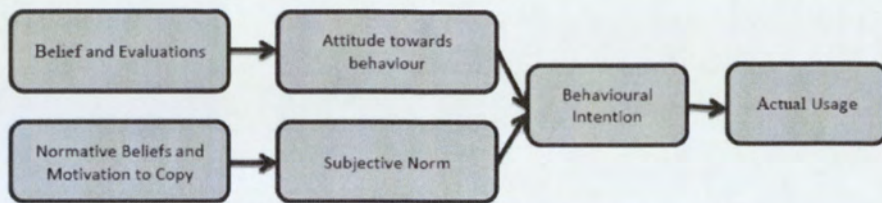
Figure 2.13: Theory of Reasoned Actions
Source: Fishbein and Ajzen (1975)

Construct	Definition
Attitudes	"Sum of beliefs about a particular behaviour weighted by evaluations of those beliefs".
Subjective norms	"Influence of people in one's social environment on his behavioural intentions; the beliefs of people, weighted by the importance one attributes to each of their opinions that will influence one's behavioural intention"
Behavioural intention	"Function of both attitudes toward a behaviour and subjective norms toward that behaviour which has been found to predict actual behaviour"

Table 2.10: Constructs of Theory of Reasoned Action
Source: Fishbein and Azjen (1975) in Sharma & Mishra (2014: 20)

2.12.3 Theory of Planned Behaviour (Ajzen, 1991)

The Theory of Planned Behaviour (TPB) contributes the idea of Perceived Behavioural Control (PBC) to the ideas referred to as 'attitudes and subjective norms' (Sharma and Muhra, 2014: 20) in the TRA. PBC indicates the judgements that people make with regards to the level of challenge associated with carrying out a certain behaviour. The origins of PBC are rooted in Self-Efficacy Theory (SET) proposed by Bandura and Adams (1977) which was developed from the Social Cognitive Theory. Bandura (1989) defined self-efficacy as the self judgments concerning how well one can complete tasks leading towards a goal in different circumstances. According to SET, self-efficacy is rated as the factor with the highest level of impact on behavioural change as it helps to develop coping behaviour.
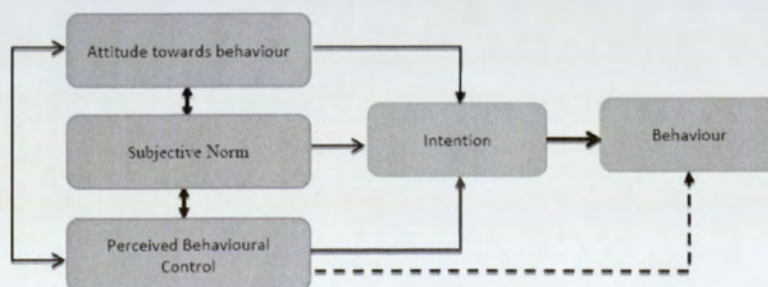
Figure 2.14: Theory of Planned Behaviour
Source: Ajzen (1991)

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Construct	Definition
Perceived Behaviour Control	"People's perception of the degree of difficulty of carrying out a behaviour, which, in turn, is dependent on self-efficacy. Self-efficacy is the self-judgments concerning well one can complete tasks leading towards a goal in different situations." (Azjen 1991, in Sharma and Mishra (2014: 20)).

Table 2.11: Additional construct used in the Theory of Planned Behaviour
Source: (Azjen 1991, in Sharma and Mishra (2014: 20)).

2.12.4 Technology Acceptance Model

The Technology Acceptance Model (TAM) is broadly utilised in the field of technology adoption research. The relative advantage of the model can be found within its simplicity. TAM incorporates two separate models for enabling the prediction of new technologies from an individual standpoint: perceived usefulness (PU) and perceived ease of use (PEU).
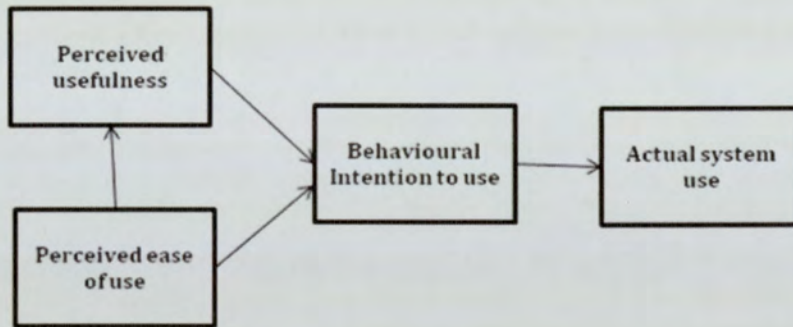
Figure 2.15: Technology Acceptance Model
Source: Sharma & Mishra (2014)

These constructs are derived from two sources. The first is Bandura's SET, a source that frames perceived ease of use as perceptions of the level of challenge involved in completing tasks leading towards a goal in different situations (Bandura, 1989). The second is Rogers and Shoemaker's (1971) concept of complexity as the perception of the difficulty or steep learning curve needed to be overcome to properly utilise a technology. This is interpreted in TAM as ease of use.

Construct	Definition	Theoretical Background
Perceived usefulness	"The degree to which a person believes that using a particular system would enhance his or her job performance"	Bandura's SET(1989)
Perceived ease of use	"The degree to which a person believes that using a particular system would be free of effort"	Rogers and Shoemaker (1971)

Table 2.12: Technology Acceptance Model added constructs, reproduced from Sharma & Mishra (2014:21).
Source: Davis (1989), in Sharma & Mishra (2014:21).

2.12.5 Unified Theory of Acceptance and Use of Technology

This theory, popularly called UTAUT, was postulated in 2003 by Venkatesh et al. following a methodical examination and unification of the concepts from eight models sourced from earlier research (TRA, TAM, MM, TPB, TAM2, DOI, SCT and model of personal computer use). The purpose of UTAUT is to be used as a methodical and thorough model that can be applied among a broad selection of applications. It has four key constructs: performance expectancy (interpreted as perceived usefulness), effort expectancy (interpreted as perceived ease of use), social influence and facilitating conditions.

During the development of UTAUT, Venkatesh and his co-researchers put together and synthesised all constructs utilised by previous models and theorised that the most significant elements in terms of the level of impact they had on people's intentions for making use of technology, from the seven concepts utilised previously, the four concepts outlined previously were the most significant. They further hypothesised that the remaining three constructs (attitude toward using technology, self efficacy, and anxiety) have no immediate and direct impact on technology use intention, since they are completely arbitrated by the ease of using them (performance expectancy). Therefore, these three constructs do not feature in the UTAUT model (Venkatesh, 2003).

However, UTAUT has been criticised for being overly complex and ambitious in terms of the approach it takes, in addition to the fact that it cannot give a clear reason for behaviour on an individual level (Casey & Wilson-Evered, 2012). Williams (2011) carried out an extensive analysis of 450 articles which referred to UTAUT, and concluded that very few studies used the UTAUT constructs. Instead, it was more frequently used for theorising.

Construct	Definition	Root source of construct from earlier models	Moderators
Performance expectancy	"Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance"	" The five constructs from the different models that pertain to performance expectancy are perceived usefulness (TAM/ TAM2), extrinsic motivation (MM), job-fit (MPCU), relative advantage (IDT), and outcome" expectations (SCT)."	Gender, Age

Effort expectancy	"Effort expectancy is defined as the degree of ease associated with the use of the system."	"Three constructs from the existing models capture the concept of effort expectancy: perceived ease of use (TAM/TAM2), complexity (MPCU) and ease of use (IDT)."	Gender, Age, Experience
Social influence	"Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system."	"The three constructs related to social influence: subjective norm (TRA, TAM2/IDTPB, TPB), social factors (MPCU), and image (IDT)."	Gender, Age, Voluntariness Experience
Facilitating conditions (no effect on use intention but direct effect on use behaviour)	"Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system."	"Three different constructs used in earlier models are: perceived behavioural control (TPB, DTPB, C-TAM-TPB), facilitating conditions (MPCU) and compatibility (IDT)."	Age, Experience

Table 2.13: Constructs used in UTAUT
Source: Venkatesh et al. (2003) cited in Sharma & Mishra (2014:25)
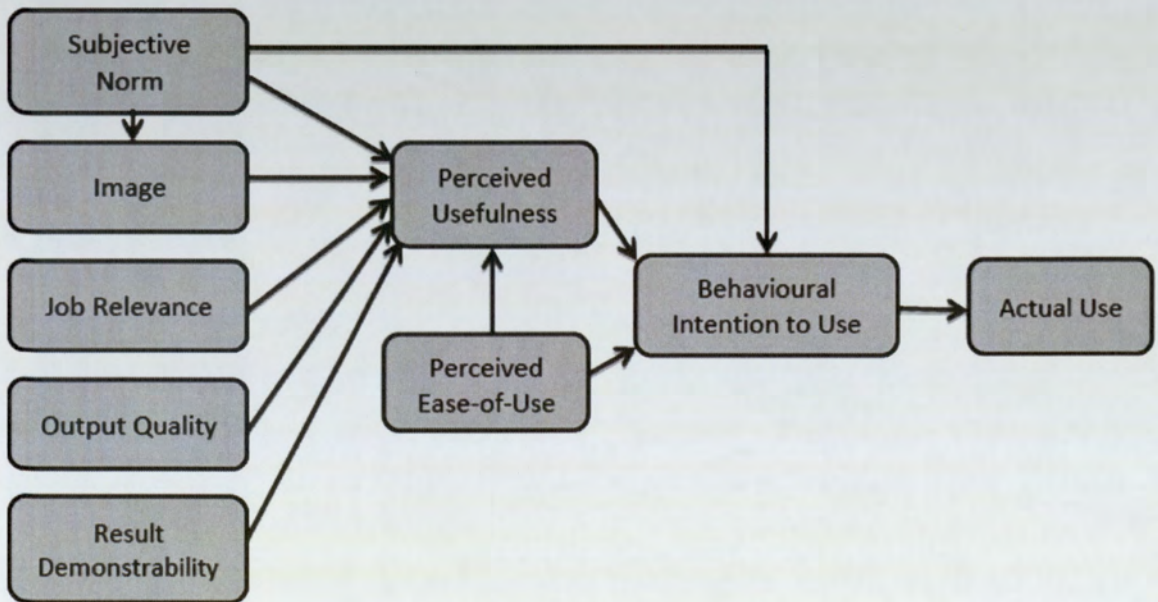
Figure 2.16: The UTAUT Model
Source: Venkatesh et al. (2003)

2.13 Summary

The aim of this chapter has been to thoroughly investigate the various factors of influence behind e-government adoption, including digital development, dividends, and consequences. With specific reference to e-government adoption, this chapter has analysed the significance, potential of and influences on e-government, while also examining the psychometric factors at play in determining the likelihood of adoption of e-government in various contexts. Finally, it looked in detail at the extant models of technology adoption and their respective strengths and weaknesses.

To summarise, rapid technological advancement has encouraged and sparked governments across the globe to take advantage of the potential that technology has to revolutionise government. In the Middle East, this will involve an overhaul of existing norms in order to rewrite the social contract to allow for widespread e-government usage and adoption. The digital revolution has caused an explosion in the use of new technologies, with the number of internet users and mobile phone owners growing exponentially in recent years. The transformative potential of ICT cannot be understated, and indeed it has been pointed out that ICT could be transformative in the achievement of all 17 of the UN's sustainable development goals (UNDP, 2015). ICT can also tackle inequality by fostering inclusion and reducing information asymmetry by opening up global knowledge bases to a global populace, while technologies such as social media can enable widespread organisation and amplification of marginalised or previously unheard voices. ICT can also increase efficiency in numerous ways; for example it empowers businesses by reducing overheads, and enables the large-scale processing of large bodies of data, removing the element of human error in many respects and enabling mass data processing, leading to more empowered and scalable businesses such as through supermarket self-checkout machines. Technology has also ushered in a new age of innovation through the sharing economy, which both creates new economies and disrupts existing ones, for example in the areas of hospitality (e.g. AirBnb), entertainment (e.g. Netflix) and transportation (e.g. Uber).

2.13.1 Digital Divide

However, the increasingly rapid development of technology is not without drawbacks. Some less developed countries do not have the infrastructure required to take advantage of these opportunities and bring about the massive economic advantages that technology can bring. This can lead to economic stratification, social exclusion, and the potential rise of industrial monopolies, in addition to increasing levels of unemployment, increased crime levels, a rise in radicalism, and inequality in income and health. This issue is exacerbated over time, as evidenced by the IDI index,

indicating that in terms of ICT development, the gap between the best performing and worst performing countries has widened (ITU, 2017b). Kuwait, UAE and KSA consistently underperform on IDI. The technological gap is also evidenced by the fact that an internet user is 22 times more likely to be from a high income family than a low income family, and mobile phone ownership is 22 times more common in high income countries, while the cost of internet services is 150 times more expensive in low income countries (UNDESA, 2016; WEF, 2016). However, though there is a correlation between the most affluent countries and IDI scores, this does not necessarily signify causation, and there could be many more factors at play.

There is also a digital divide between individuals in terms of gender and age. According to research, men disproportionately benefit from technology due to comprising a larger proportion of users. Age is also a dividing factor, with digital natives having an advantage over digital immigrants as they have been born and raised in a world that relies on technology. Geography and human capital also play an important role in technology adoption, as better infrastructure and higher household income leads to more affordable technology and better accessibility.

2.13.2 Benefits of e-government

E-government enables governments to deliver better services and to cut costs, while also fostering the growth of more institutional transparency, and more responsiveness to the needs of the people, while simultaneously increasing accessibility of government services and empowering more vulnerable groups. The types of e-government are G2C (broadening channels of communication between governments and citizens), G2B (enabling businesses to take better control of their taxes, renew licenses etc), G2G (enabling better co-operation between governmental departments and streamlining processes) and finally G2E (the application of ICT to human resource management). The adoption of e-government is necessary to unleash its full potential. The full potential of e-government can be seen in examples from other countries. For example, Finland involves its citizens in discussions of governmental policies through an online forum, helping in the democratic forming of laws and regulations. Another strong determinant of success of e-government, however, is its acceptance by government officials, and this is an obstacle that must be overcome before the full advantages can be realised.

In terms of e-government development, the EDGI (e-government development index) is a useful tool in measuring the success and development of e-government across different countries. Despite continued investment in ICT by the government, KSA dropped 8 places in EDGI ranking between 2016 and 2018 (UNDESA, 2018).

2.13.3 Culture, Identity, Cultural transmission and Technology

Technology and the rapidly changing global landscape must also be examined through the lens of culture and identity. Culture, for example, can be defined most simply as patterns of behaviour, which emerge when passed from one generation to another. The culture of modern technology, therefore, is one that will be passed down from generation to generation, transforming as it is passed down. Technology is a product of and an emergent property of cumulative cultural evolution (Noranzayan, 2005) and it is impossible to separate from culture. Furthermore, not only is technology vital for cognitive development, but the plasticity of the brain at a young age means that the unprecedented exposure to technology of young people of the new generation has re-shaped and fundamentally altered the brains of digital natives (Prensky 2001a; 2001b). For instance, there is a clear preference for graphical rather than textual information among the digital generation, a capacity for parallel processing and multi-tasking, a tolerance for difference and diversity, and a tendency to challenge the status quo while demanding and expecting more from organisations (Ipsos MORI, 2010). In KSA, the digital revolution has led to the emergence of a generation that is politically aware, religious, highly educated, economically empowered and simultaneously technologically fluent, a type of empowered generation that is unprecedented.

This background section has also presented a thorough overview of critical background literature to the research, including Values theory (Schwartz, 1992), cultural theory of risk, and theory of cultural dimensions, also covering cultural concepts more specific to Arab culture, such as Wasta, Arab identity and language, and values. The main Technology Adoption Models were also explored, including Rogers' Diffusion of Innovation Theory (1962), Theory of Reasoned Action (Fishbein and Ajzen, 1975), Theory of Planned Behaviour (Ajzen, 1991), Technology Acceptance Model (TAM) (Sharma & Mishra, 2014) and finally the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003).

3   Methodology

3.1   Introduction

The aim of this extensive examination is to develop an exhaustive list of all most recent published and unpublished studies which relate to the adoption of e-government in countries which are classed as developing, such as KSA, by utilising a systematic literature methodology.

3.2   Systematic literature review

The purpose of a systematic literature review is to make use of a definitive and thorough set of criteria in order to establish, critically evaluate and unify the wide range of academic material available on a subject. Studies of this nature can be put together in order to determine their commonalities and shared factors and subject matter. Conclusions of phenomenological research and grounded theory could also be assimilated and used. Key elements from each study are analysed and synthesised, which aids in meeting the objective of reconstructing single academic conclusions into a broader picture, producing new ideas and interpretations (Polit & Beck, 2006).

The literature search was conducted across several corpuses covering the period from 2014-2018 to ensure to cover the most up-to-date research on the issue, while excluding outdated research. According to Keesing (1974), technology is a product of cumulative cultural evolution, thus it moves along with cultural change. Technology influences us in turn; a co-evolution with the dynamics of the society (Pineda, 2014). Moore's Law reflects the rapid pace of change in technology that is having huge ramifications for traditional institutions. It asserts that "the speed of computers as measured by the number of transistors that can be placed on a single chip, will double every year or two" (Mollick, 2006). In the business world, the rapid change of technology is considered a threat to an organisation's business model and survival (Lai & Zainal, 2015; Lai, 2017). Thus, the search was kept at approximately two   Moore's Law.

The studies were restricted to countries that were economically or culturally similar to KSA (based on Hofstede's dimensions of culture). Any exceptions to the rule were intentionally left in to show contrast and possibly validate theoretical assumptions.

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Table 3.1 Search Terms

Government	E-government Adoption/Diffusion, Mobile government adoption/ diffusion, Digital government / Diffusion. .
Culture	Cultural factors and e-government, non-technological factors e-government, social norms and e-government, national Identity and technology,
Adoption	E-government adoption, E-government diffusion, Innovation adoption/diffusion.
Country	E-government KSA, E-government GCC, E-government MENA, E-government Arab states, E-government in developing countries.

Table 3.2 Databases Searched

Google Scholar
Science Direct
Aston University Library
Springer Link
EBSCO

3.3 Inclusion and Exclusion Criteria

- Studies must be published on or after the year 2014.
- The paper must address citizen adoption of e-government and not adoption by organisations.
- The paper must also be geared towards developing economies or Arab states.
- Studies must also address non-technological factors.

3.4 In-Reference Search

A quick review of reference lists of the literature already chosen was undertaken. After reading through the abstracts, papers that met the inclusion criteria were also included in the study.

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┌────────────────────────┐
│ Total Number of Articles│
│        = 175            │
└────────────────────────┘
            │                          ┌────────────────────────┐
            │                    ⟹     │  Articles Rejected from │
            │                          │   Abstract and titles   │
            │                          │         = 94            │
            │                          └────────────────────────┘
┌────────────────────────┐
│    Articles Chosen      │
│        = 81             │
└────────────────────────┘
            │                          ┌────────────────────────┐
            │                    ⟹     │ Articles Rejected After │
            │                          │        Analysis         │
            │                          │         = 41            │
            │                          └────────────────────────┘
┌────────────────────────┐
│ Articles found Relevant │
│      from studies       │
│         = 40            │
└────────────────────────┘
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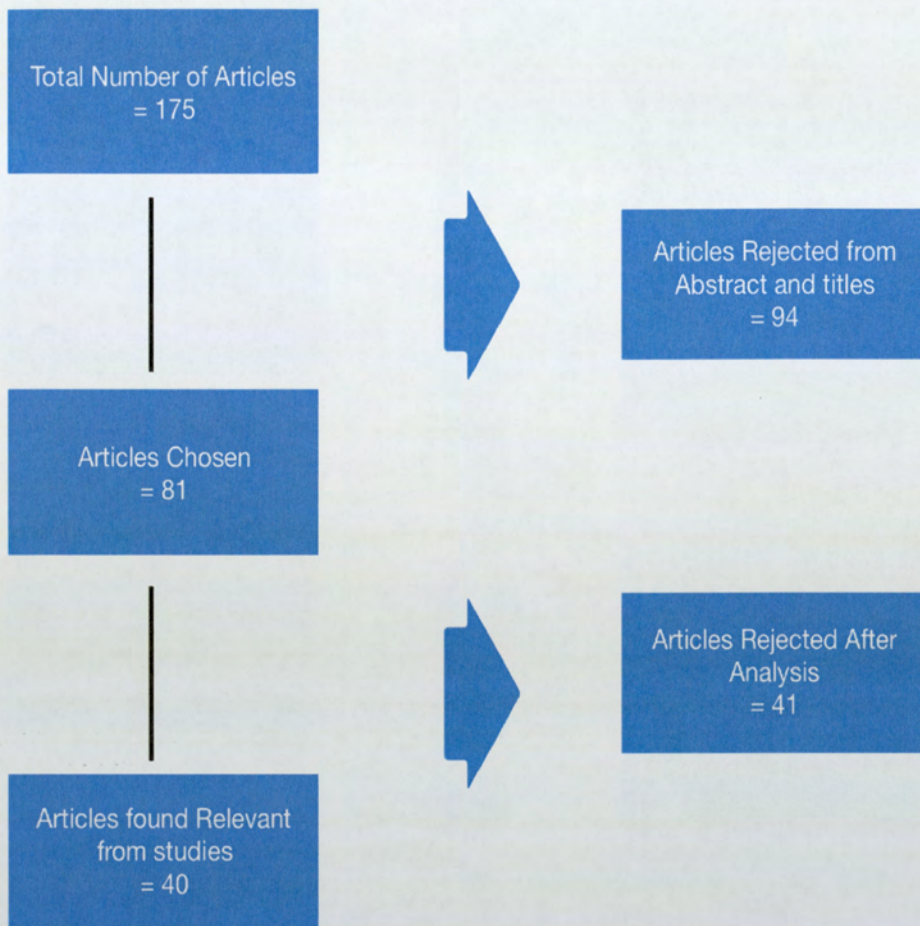
Figure 3.1: Schematic of systematic literature review.

3.5   Data Reporting

To report and present the data that was collected from the 40 articles that were chosen, a 7-column table was created (see Appendix A) in order to examine the approach, aim, findings, behavioural-intentional determinant, model used and country of analysis in each study.

4 Results

4.1 Introduction

In order to identify the effects of socio-cultural norms on the adoption of e-government in GCC countries, a collection of forty articles were systematically reviewed, to aggregate the experiences gained from a range of different articles and studies. The summary of these articles is presented in **Error! Reference source not found.**. These studies were related to 15 different countries as shown in Table 4.3, adopting seven different models as listed in Table 4.5. On the basis of these collected up-to-date and studies related to the adoption of e-government in countries comparable to KSA it is possible to identify common core elements and factors related to the cultural dimension and individual perceptions of adoption of e-government.

As summarised in **Error! Reference source not found.**, Al-Hujran et al. (2015) investigated the factors that impact e-government adoption in Jordan. The findings emphasized the significance of dominant local values and culture as one of the most important factors affecting Individual attitudes which in turn determines citizen intention. It is essential to note that the ease of use of e-government services is a fundamental necessity.

Joseph (2017) proposed an adaptive model for adoption of e-government innovations. In the case of Zambia the actual usage of e-Government applications was very low at only 29%. Although the majority of the study respondents have the required ICT skills to effectively engage with e-Government applications and websites, the study revealed that large numbers of e-Government projects have failed to meet the majority of the expectations of the population and business organisations. The reasons for this vary between lack of awareness of the existence of e-Government services in the country (which reflects the importance of awareness campaigns) to the lack of trust in these applications. The majority of respondents felt that most e-Government platforms and services are unreliable and not trustworthy due to the lack of security policies; therefore they do not feel comfortable about sharing personal information on such open platforms. This indicates the influence of social perception when a change is generally perceived as not being useful and worth engaging in. Alzahrani et al. (2016), Athmay (2016), Rodrigues et al. (2016) and many others highlighted the importance of the user satisfaction factor and the significance of the Information System (IS) success model of Delone and McLean (D&M IS). In summary, trust and social influence are the most significant factors

influencing individual decisions to adopt e-government (Susanto & Ajioza, 2015; Ally & Levy, 2014; Majdalawi et al., 2015).

4.2 Summary

The studies concluded that there are many factors influencing individual behavioral intentions as summarized in Table 4.4. Trustworthiness and usefulness came first with 21 and 9 incidences respectively. User satisfaction and ease of use came second with 7 for each. The quality of the services provided and other social influences including compatibility and affordability of accessing the service scored less than four incidences.

Abbreviation	Full Designation
PEU	Perceived Ease of Use
PU	Perceived Usefulness
SI	Social Influence
RA	Relative Advantage
CSE	Consumer Self Efficacy
IQ	Information Quality
ISQ	Information Systems Quality
FC	Facilitating Conditions

Table 4.1: Table of abbreviated constructs

4.3 Systematic Literature Review

The Systematic Literature Review that was conducted can be seen summarised in Appendix A. Tables 4.2, 4.3, 4.4 and 4.5 show the breakdown of methodologies used in the articles presented in Appendix A, a breakdown of countries investigated in the articles used, incidence of factors affecting behavioural intention in studies reviewed, and incidence of acceptance models used in studies reviewed, respectively.

Research Approach	Number of Articles
Quantitative	22
Qualitative	7
Literature review	6
Mixed Methods	5

Table 4.2: Table showing the breakdown of methodologies in used articles

The table above shows that the majority of articles reviewed took a quantitative approach to research, while the number of studies taking a qualitative, literature review, or mixed methods approach were low in comparison. As the current study is a quantitative study that uses a systematic literature review methodology, it aims to contribute to the growing body of research that uses a similar research approach. The countries investigated in the studies chosen were spread out across 15 countries in total, with a very small majority of studies being based on data obtained from KSA. As such it can be concluded that there is a high level of interest in the subject in KSA and the topic is a growing one, with research growing in the area of e-government and technology adoption in KSA. As such this paper will aim to contribute to this growing body of research on technology adoption in KSA.

Table 4.4 illustrates that the 3 most important factors influencing behavioural intention according to the studies reviewed, were Trust, Perceived Usefulness, and Perceived Ease of Use, respectively. As such these are reflected in the conceptual model that is produced by this paper and it can be concluded that they contribute heavily to the factors underpinning technology adoption and e-government adoption. Finally, the 2 most frequently used acceptance models were TAM and UTAUT, however UTAUT is more frequently used for theorising while TAM is used in a more practical way.

Country of Research Origin	Number of Articles
Bahrain	2
China	3
India	1
Indonesia	2
Kuwait	2
Lebanon	1
Oman	2
KSA	5
Spain	2
Taiwan	1
Turkey	1
UAE	4
United Kingdom	2
United States of America	3
Zambia	1

Table 4.3: Breakdown of countries investigated in studies reviewed

Factors Influencing Behavioural Intention	Incidence
Trust	21
Quality (Information & System)	4
Satisfaction	7
Education	1
Age	3
Self Efficacy	3
Perceived Usefulness	9
Perceived Ease of Use	7
Social Influence	4
Facilitating Conditions	4
Relative Advantage	2
Complexity	1
Attitude	3

Perceived Credibility	1
Compatibility	1
Economic Status	2
Uncertainty	1

Table 4.4: Incidence of factors affecting behavioural intention in studies reviewed

Acceptance Model	Incidence
TAM	11
UTAUT	11
TRA	2
DOI	3
D&M IS Model	4
TPB	1
TAM2	1

Table 4.5: Incidence of acceptance models used in studies reviewed

5 Discussion

5.1 Conceptual models

TAM is the most widely used technology adoption model (Sternad & Bobek, 2013; Alshehri & Drew, 2010; Khan & Woosley, 2011). It has also been empirically validated on numerous occasions and found to be rigorous, its constructs having significant direct or indirect effects on short- and long-term intentions to use technological innovations (Zhang et al., 2007; Szajna, 1996; Al-Gahtani, 2001). The systematic literature review conducted during this research revealed that studies were dominated by UTAUT and TAM. In deciding between these two, many studies have suggested TAM was more successful in modelling behavioural intention (Rahman et al., 2017) while UTAUT draws directly from literature associated with TAM (Dwivedi et al., 2010). In a systematic literature review, Williams (2011), found that from a review of 450 citations of UTAUT only 43 actually incorporated UTAUT constructs or utilised it in any meaningful way. Thus, TAM was used as the skeletal framework for the conceptual model that is presented here.

Figure 5.1 shows the developed conceptual framework for e-government adoption in KSA. The framework encapsulates socio-cultural factors as well as technical and personal factors. These factors were identified by the systematic literature review of the existing research on e-government adoption, the technology adoption models used, and their findings. It is also the result of studying the socio-cultural norms that impact technology usage in the GCC countries, especially KSA.

Figure 5.1 shows that socio-cultural factors, including demographic status (ADG) and long-term orientation (LTO) in society, may have a positive effect on the decision to use e-government services in KSA, while other norms may limit the use of e-government services, such as *wasta*, distance power, values, identity and language, short-term orientation (SLO) in society, and citizens influenced by traditions and cultural transmission.

Technical factors such as facilitating conditions, relevance and quality may positively affect perceived usefulness and trust in using e-government services in KSA.

Computer self-efficiency may have an effect on behavioural intention (BI) and perceived ease of use of e-government services. In addition, user satisfaction may positively affect the use of e-government services. Trust has a positive effect on user satisfaction when using e-government services. Figure 5.1 shows a conceptual framework and a summary of the findings found in the literature that explains some of the factors and their effect on e-government services.
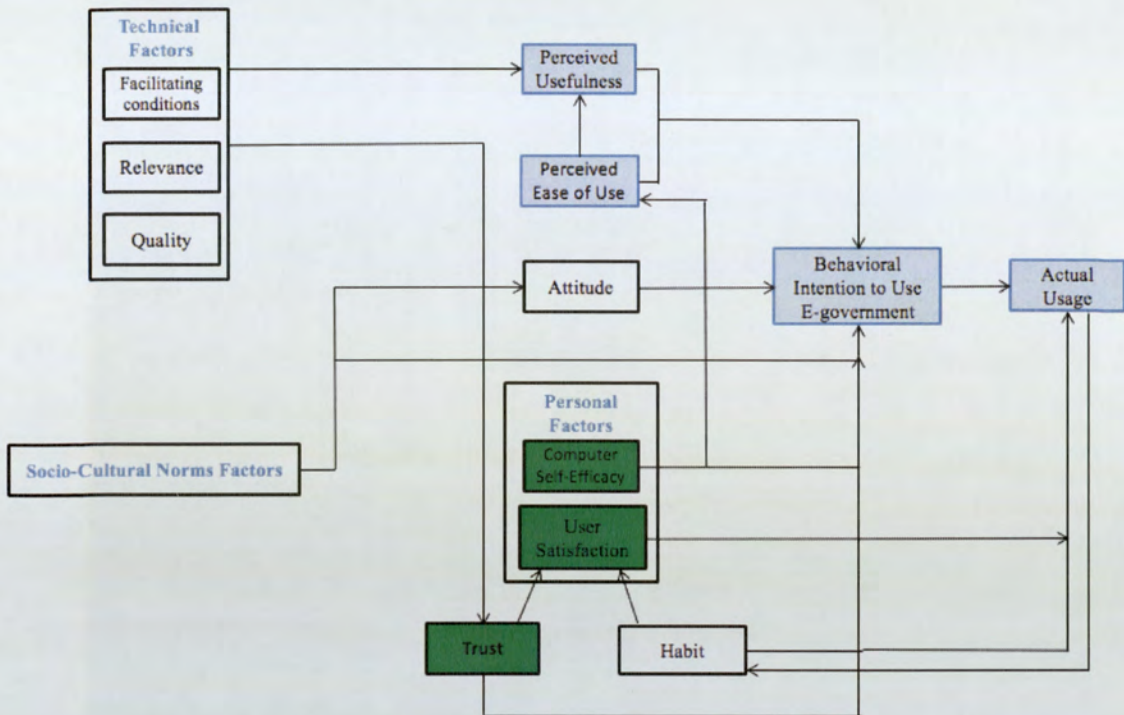
Figure 5.1 E-government adoption conceptual framework

5.2 Trust

Trust is ubiquitous in the reviewed literature as one of, if not the most, significant antecedent of BI to adopt e-government. Several studies show that trust is a huge determinant of intention to adopt e-government (Abu-Shanab & Khasawheh, 2014; Meftha et al., 2015; Mahmood et al., 2014; Hariguna et al., 2017). Trust encompasses both technical and psychological factors (Alraja et al., 2018); Trust in e-government services and their performance and availability (Sharma, 2015), together with trust in government and system administrators (Alzahrani et al., 2018; Rodrigues et al., 2016) bring up issues of privacy, confidentiality etc. and trust in the reliability of the information being provided (Alenezi et al., 2017).

Trust is an important determinant of intention to adopt e-government but information quality also has a huge moderating effect on trust (Alzahrani et al., 2018). The literature review highlighted that in KSA, females had a higher trust in e-government than males, and older individuals also displayed greater trust in government than their younger counterparts. This is the complete opposite of the findings of studies such as those by Czaja et al. (2006). Gupta et al. (2016) conducted a systematic literature review which was a meta synthesis of factors affecting e-government adoption and concluded that trust and user satisfaction are both significant determinants of e-government adoption. However, trust also has a moderating

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effect on user satisfaction. Rodrigues et al. (2016) also arrived at the same conclusion after carrying out an analysis of quantitative data.

5.3 Quality (IQ & ISQ)

Quality has a significant effect on citizens' intention to adopt e-government (Sjafrizal & Jacob, 2017; Ally & Levy, 2014). Alenezi et al. (2017) concurred with this conclusion, positing that information quality (IQ) specifically, has an effect on the overall perceived usefulness of adopting e-government. Sharma (2015) also showed that the service quality (ISQ) also coloured perspectives on the perceived ease of use of e-government systems, Users often saw no advantage in using these systems. However, measurement of quality as a construct has not been standardised, and studies often have different definitions of the same construct. Alenezi et al. (2017) also uncovered two new barriers to e-government in their qualitative study of the Arab World: *wasta* and nepotism. *Wasta* and nepotism affect service quality and perceived usefulness of services.

5.4 User Satisfaction

User satisfaction is a relatively nebulous construct. There can be numerous reasons why a user is satisfied. These include trust (Rodrigues et al., 2016), quality, habit and inertia (Rey Moreno & Medina Molina, 2017). This is a psychological state in which perception matches expectations (Myers, 2003). The members of the ADG have high expectations regarding transparency and competence from their government. Satisfaction is a construct in BI than can positively influence adoption as well as possibly acting as a barrier causing rejection of technology adoption.

5.5 Computer Self-Efficacy

Computer self-efficacy is a significant determinant of intention to adopt digital public services (Rey Moreno & Medina Molina, 2017; Rabaai, 2015). Low self-efficacy acted as a barrier to BI for e-government adoption and vice versa for high self-efficacy (Alomari, 2014). These studies confirm the assumptions of Bandura's self-efficacy theory (SET) (Bandura & Adams, 1977). This is also a consequence of the relatively lower human capital development in KSA and the GCC. In an increasingly digital economy, the skills and ability to utilise technology to create value is of paramount importance (WEF, 2017).

5.6 Social Influence

This is a construct not outlined in our conceptual framework. Many studies showed that social influence has a significant impact on decisions to adopt e-government (Susanto & Ajioza,

2015; Majdalawi et al., 2015; Rabaai, 2017; Zawaideh, 2016). However, other studies also categorically stated that social influence has no influence on BI to adopt e-government (Das, 2017; Zhao et al., 2014; Fakhoury & Aubert, 2015). Social influence was ultimately left out because the ADG is more individualistic and therefore less prone to social influence. Pineda (2014) postulates that digital natives have technology as their latent culture. Social Influence would not be a main factor in the decision to use e-government alternatives to the status quo.

5.7 Attitude

Attitude towards e-government affects intention to adopt its services (Qasem & Zolait, 2016; Al-Hujran et al., 2015; Das, 2017; Rodrigues et al., 2016). According to Al-Hujran et al. (2015) and Rodrigues et al. (2016), attitude is influenced by perceived ease of use of e-government services. Zhao et al. (2014) posits that attitude is heavily influenced by culture. This opinion was also asserted by Rufín et al. (2018). Zhao et al. (2014) argue that government adoption increases as the GNI per capital increases, a correlation also noted by UNDESA (2018). This is refuted, however, by the comparison of GNI per capita and IDI scores for KSA (World Bank, 2016; ITU,2017a) and EGDI scores and GDP for KSA (World Bank, 2018; UNDESA, 2018), suggesting that the correlation between affluence and e-government adoption is not a simple one for KSA and the GCC. It holds true in the case of Kuwait but not for KSA.

5.8 Facilitating Conditions

Facilitating conditions (FC) are the technical factors that underpin the performance and competence of an ICT system (Zawaideh, 2016). FC are very pertinent to citizens' intention to adopt e-government (Majdalawi et al., 2015; Rabaai, 2017). FC are important for ITU (2017a), since investment in ITU infrastructure is one of the prerequisites for creating an information society. Hard issues cannot be ignored as they form the bedrock of the system (Das, 2017). This correlation seems to hold mostly in underdeveloped countries like Sub-Saharan Africa (UNDESA, 2018), a designation that does not apply to the GCC (IMF, 2018).

5.9 Summary

The model above is based on several other proposed models and builds on them, taking into account all factors raised on technology and e-government adoption in the literature. Building on Fishbein and Azjen's Theory of Reasoned Actions (1975), the model has the concepts of Attitudes, (i.e. an individual's beliefs about a certain behaviour), Subjective norms (i.e. norms and status quo of one's individual environment and the impact of these on

an individual's understanding of normality), and finally Behavioural Intention (i.e. a predictor of behaviour taking into account both their attitudes and subjective norms), built in. Within the concepts of attitudes and subjective norms is contained Sharma and Muhra's Theory of Planned Behaviour (2014), which contributes the idea of Perceived Behaviour Control; the concept that an individual's perspective of the level of challenge involved in carrying out a behaviour is also a strong factor in deciding behavioural intention, and in turn is based on an individual's perspective of their own self-efficacy, i.e. one's own confidence in their abilities to carry out an action.

The model has also built in the Technology Acceptance Model (TAM), specifically the concepts of perceived usefulness, a concept borrowed from Bandura's SET (Bandura, 1989), and perceived ease of use, a concept borrowed from Rogers and Shoemaker (1971). These ideas build on the notions that behavioural intention is also affected by an individual's perception of the usefulness of a particular system, combined with the perceived level of usability of that system.

Finally, the model above also builds upon Venkatesh et al. (2003), by including concepts of relevance and quality.

By synthesising models of technology adoption with socio-cultural concepts and norms with an impact on e-government adoption, the model proposed above presents a new framework that encapsulates the socio-cultural norms in KSA and provides a thorough overview of all factors influencing e-government adoption.

6 Conclusions

6.1 Research Implications

Saudi culture is collectivist and high in power distance (Hofstede et al., 2010) with a prevalence of *wasta* (Cunningham & Sarayrah, 1994; Aldossari & Robertson, 2015). Therefore, a rapprochement between these two values needs be found.

Culture is not static and is constantly being redefined (Keesing, 1974), meaning that factors that influence e-government adoption change over time (Joseph, 2017). Clearly, it is very important to continually study these constructs to account for emerging cultures like that of the ADG.

KSA and the GCC need to focus on three areas: Firstly, human capital development, which is of crucial importance; secondly, information quality to ensure that users find this relevant to their needs, and finally, trust. This includes trust in every sense of the word, namely, data security, competence, quality, organisational performance, legal and political protection.

6.2 Summary of Research

To summarise, this research has systematically reviewed forty studies and identified the social-cultural norms that impact on e-government adoption in countries that are culturally or economically similar to KSA. It also reviewed the technology models underpinning these studies, and summarised their findings. The results showed that UTAUT and TAM were the dominant adoption models used among those described earlier, with the latter proving more successful in modelling BI. The results also showed that trust and usefulness were the factors that had the greatest effect on e-government adoption.

The results emerging from the data collected from studies included in this paper can be summarized to generate evidence about socio-cultural factors that affect the adoption of e-government in GCC countries especially in KSA.

6.3 Research Contributions

The main contributions of this research have been in identifying, emphasizing and underlining the importance of the role of socio-cultural factors in the adoption of e-government by a systematic review of the literature on e-government and technology adoption models. Furthermore, the research contributes a unified conceptual adoption framework of the process of e-government adoption, taking into account not only theories and concepts from the areas of technology adoption and e-government, but also socio-cultural norms in KSA, and unifying them.

6.4 Limitation and further research directions

One of the weaknesses of this research is its lack of primary data due to the fact that the conceptual model has not been empirically validated to test its effectiveness at predicting e-government adoption and robustness in KSA. In addition, it has not been given to experts in the field for validation in the form of a focus group. Though it is a weakness of the study this is due to the fact that the model has been used in UAE previously.

Throughout this research, it has been impossible to ignore the sheer number of studies replete with theories and models about BI leading to actual usage. This does not always hold true (Rey Moreno & Medina Molina, 2017), since intention does not always lead to actual usage. Habit, inertia, rejection and status quo bias are all factors which stymie the effects of BI. This could form the basis of further studies. Future research could also focus on factors that influence continued usage or rejection.

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8 Appendices

Appendix A: Systematic review of E-government adoption articles (2014-2018)

Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
Susanto & Ajioza (2015)	Mixed methods	To explore if PU and PEU remain dominant factors for e-government adoption	Trust and social influence are the most significant factors affecting an individual's decision to adopt e-government.	Trust, SI	TAM	Taiwan
Hariguna et al. (2017)	Quantitative	To empirically validate the UTAUT model with ISQ added.	Performance expectancy, effort expectancy and ISQ are all significant factors in affecting e-government adoption.	PU, PEU, Satisfaction, ISQ, Trust	UTAUT	Indonesia
Majdalawi et al. (2015)	Mixed methods: Quantitative, Qualitative & Literature Review	To identify the factors influencing utilisation of e-government in Jordan	Factors influencing the implementation of e-Government services in Jordan are facilitating conditions, trust, social influence, awareness and resistance.	Trust, Social Influence	N/A	Jordan
...lly (2014)	Mixed Methods: Quantitative, qualitative & Literature Review	To investigate the effect of IQ on individuals' trust in e-government systems.	IQ has a significant effect on trust in e-government systems	Trust	N/A	USA
...asem & ...lait (2016)	Qualitative Survey (n= 631 participants)	To investigate citizens' intentions towards using e-government services.	Satisfaction, trust and attitude towards government services are essential antecedents of Bahraini behavioural intentions towards e-government.	Trust, Satisfaction, Attitude	TAM, UTAUT, TRA, DOI.	Bahrain
...baai (2015)	Mixed Methods: Qualitative & Quantitative	To ascertain the factors influencing e-government adoption in a developing country.	PEU is the most important factor in predicting Jordanian citizens' adoption of e-government services	PEU	TAM	Jordan
...baai (2017)	Mixed Methods: Qualitative & Quantitative	To examine the factors determining adoption of e-government services in Jordan.	Performance expectancy, effort expectancy, social influence and facilitating conditions significantly affect the adoption of e-government services in Jordan.	PU, PEU, SI, FC.	UTAUT	Jordan

Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
Rufín et al. (2018)	Qualitative: Survey of US/Spanish citizens	To assess the fundamentals of e-government adoption in the USA and Spain by test hypotheses derived from adoption literature and Hofstede's dimensions of culture.	Compatibility and perceived ease of use affect US and Spanish e-government cultures differently, confirming Hofstede's dimensions of culture.	PEU, Compatibility	TAM	USA & Spain
Abu-Shana & Khasawheh, (2014)	Qualitative	To investigate Jordanian perception of E-government services and effects of the digital divide.	Jordanians consider infrastructure to be the biggest barrier to e-government adoption.	CSE, FC, Trust	N/A	Jordan
hao (2014)	Quantitative	To investigate the effects of the digital divide on e-government development.	Economic status is not a significant predictor of the digital divide or e-government development.	CSE	N/A	UAE
akhoury & ubert (2015)	Quantitative	To investigate the determinants of e-government acceptance in Lebanon.	Trust and active citizenship impact positively on behavioural intention to use e-government services.	Trust, Governance	UTAUT	Lebanon
ao et al. 014)	Quantitative	To explore how national cultures affect e-government diffusion.	Cultural characteristics affect e-government adoption. GNI per capita increase has a moderating effect on cultural factors.	Economics	N/A	China
pta et al. 016)	Literature Review	To conduct an extensive review of various adoption models used for studying e-government.	Proposes a tailor-made conceptual model for examining citizen adoption of e-government in India.	Trust, Satisfaction	UTAUT	India
esher & oks (2018)	Quantitative	To understand the influence of trust on e-government adoption.	Trust is a significant determinant of e-government adoption by citizens	Trust	UTAUT	KSA
ahrani et 2018)	Qualitative	To investigated how gender, age, and	Females evaluate online services more positively than males. Older people	Trust	N/A	KSA

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Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
		internet experience influence trust in e-government adoption.	displayed greater trust in e-government than younger ones. Internet experience positively influences user trust.			
Mahmood et al. (2014)	Literature Review	To investigate the role of trust in e-government adoption.	Trust plays a significant role in take-up of e-government services and adoption.	Trust	N/A	UK
Alenezi et al. (2017)	Qualitative	To investigate information quality as a contributor to e-government success.	IQ makes a positive contributor to e-government adoption, along with cost-saving and customer satisfaction. *Wasta* and nepotism acted as barriers.	IQ, Satisfaction	N/A	Kuwait
Choudrie et al. (2017)	Qualitative	To investigate adoption of e-government services by older adults in a region of KSA	Age, gender and education-based digital divides exist in KSA.	Age	N/A	KSA
ey Moreno & ledina olina (2017)	Literature Review	To study the inhibitors to the use of digital public services.	Organisational support, self-efficacy, benefits, loss aversion, regret aversion, control, transition costs, sunk costs/switching costs, uncertainty, habit, resistance, and inertia were identified as inhibitors of e-Government adoption.	Habit, Inertia, CSE, Resistance.	N/A	Spain
waideh)16)	Quantitative	To examine acceptance of e-government and the major factors influencing application of e-government in the Jordanian context.	Performance expectancy, effort expectancy, social influence and facilitating conditions significantly impact respondents' intention to use e-government services.	PU, PEU, SI, FC	UTAUT	Jordan
ahrani et (2016)	Quantitative	To investigate the influence of technology, government agencies, risk and personal characteristics on e-government adoption.	Technical factors and personal characteristics impact positively on trust in e-government while government agencies and risk impact negatively.	Trust	DeLone & McLean Inform-ation System (D&M IS)	KSA

Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
					Success Model	
...harma et al. ...2014)	Quantitative	To investigate the influences that technology acceptance factors have on e-government service users in KSA.	User satisfaction and trust were shown to influence technology acceptance significantly.	Satisfaction, Trust, PU, PEU	TAM	KSA
...jafrizal & ...acob (2017)	Literature Review	To identify critical factors influencing e-government adoption in Indonesia.	A conceptual model of e-government adoption was proposed for improving service to citizens.	Quality, Trust	UTAUT	Indonesia
...enkatesh et ... (2016)	Quantitative	To investigate how citizens' uncertainty about e-government services can be managed.	Information quality and channel characteristics predict citizens' intentions to use e-government. Transparency and trust both mediate and moderate its effects.	Uncertainty	N/A	Hong Kong & China
...rhini et al. ...017)	Qualitative	To understand the factors that may influence or hinder e-government strategic benefits in Kuwait.	Information quality, strategic benefits, institutional values, cost-saving and customer satisfaction achieve better e-government benefits.	Satisfaction	N/A	Kuwait
...eftah et al. ...15)	Quantitative	To investigate factors affecting citizens' intention to adopt e-government services.	Trust had the closest relationship to e-government adoption.	Trust	N/A	Bahrain
... (2017)	Quantitative	To identify determinants of e-government adoption in China.	Trust has a positive effect on social norms.	Trust	TAM, TPB	China
...i & ...iane (2015)	Quantitative	To identify the factors associated with citizens' intention to use e-government services in Abu Dhabi.	Proposed a modified TAM model for adoption in Abu Dhabi.	PU, PEU, Trust	TAM	Abu Dhabi (UAE)

Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
Alraja et al. (2018)	Qualitative	To determine the critical factors affecting citizen adoption of e-government services in Oman.	Trust in the internet and relative advantage are significant indicators of citizens' intention to use government services.	Trust, RA	D&M IS Success Model, DOI	Oman
Abu-Shanad (2014)	Quantitative	To explore technology adoption research and test a trust antecedents model in Jordan	Trust significantly predicted intention to use e-government services.	Trust	TRA	Jordan
thmay (2016)	Quantitative	To explore the relationship between adoption factors and intention to use e-government services in the UAE.	User satisfaction is a significant determinant of intention to use e-government in the UAE	Satisfaction	D&M IS success Model, UTAUT	UAE
harma (015)	Quantitative	To study the relationship between service quality, demographics and intention to use e-government services in Oman.	Service quality (reliability, security, efficiency and responsiveness) are significant determinants influencing willingness to use e-government services along with two demographic variables: age and educational level.	Quality (Reliability, Security, Efficiency, Responsiven ess) Demographic s (Age, educational level)	N/A	Oman
drigues et (2016)	Quantitative	To identify constructs and factors important to user-centric transformation of e-governments in UAE.	Confidentiality and user trust and attitudes toward using technology are identified as key determinants of overall satisfaction and subsequent adoption of e-government services.	Trust, Satisfaction	UTAUT	UAE
mari 14)	Quantitative	To provide insight into and evaluation of factors that may influence effective functioning of e-government in Jordanian society through its interaction with citizens.	The main factors determining e-government service adoption in Jordan are: trust in the internet, website design, religious beliefs, internet and computer skill confidence, word of mouth, resistance to change, perceived usefulness, relative advantage and complexity.	PU, RA, Complexity, CSE	DOI, TAM	Jordan

Author/s	Research Approach	Aim of the Study	Research Findings	Behavioural-Intention Determinant (s)	Model	Country
Al-Jamal & Abu-Shanab (2015)	Quantitative	To explore the influence of age as a predictor of technology acceptance utilising the original technology acceptance model.	Age was found to be negatively associated with intention to use in Jordan.	Age	TAM	Jordan
Ozen et al. (2018)	Literature Review	To investigate factors affecting user behaviour in e-government acceptance.	The most commonly used variable in the studies was perceived ease of use. The most examined interaction was the positive effect of perceived usefulness on intention.	PU	TAM	Turkey
Alzahrani et al. (2016)	Literature Review	To explore the adoption of e-government from the perspective of citizen trust.	It develops a conceptual framework presenting the antecedents of trust in e-government adoption.	Trust	D&M IS Success Model	UK
-Hujran et (2015)	Quantitative	To investigate factors impacting e-government adoption in Jordan.	Attitude is the most significant determinant of citizen intention and is jointly determined by perceived public value and perceived ease of use.	Attitude	TAM	Jordan
seph (2017)	Quantitative	To propose an adaptive model for e-government adoption	Factors that influence adoption change over time as the individual's preferences and technology evolve.	PU, SI	UTAUT, TAM, TAM2	Zambia
s (2017)	Quantitative	To study how affluence, human capital, ICT infrastructure and governance affect the maturity of e-government.	A high level of e-government maturity can be achieved purely through ICT infrastructure investment.	Attitude, Trust	N/A	USA