

# **The Challenges of Developing Smart Services Projects in the United Arab Emirates**

التحديات في تطوير مشاريع الخدمات الذكية  
في دولة الإمارات العربية المتحدة

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## Declaration

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### Dissertation Release Letter

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## Abstract

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The UAE's ecosystem has become more complicated in terms of activity operations which have increased rapidly over the past few years. That is due to several factors that include migration to cities and the enlarged expatriate population. As a result, the activities overload along with the demands that are associated with adapting to the new changes has become a major problem. Consequently, the government still has to fulfill in to the request for finding sustainable and agile solutions that have the potential abilities to enhance the cities' infrastructure and provide high quality and long-term standards for residents.

This dissertation demonstrates the literature review of the concept and criteria of Smart City and defines the smart services projects applied by government. The literature section explores a case study that was conducted in South Korea in order to obtain more knowledge about the field. This dissertation seeks to answer unresolved questions that are directly relevant to this research as well as highlighting the challenges associated with applying smart services in the government sector in the UAE. Furthermore, it aims to illustrate the influence of stakeholders in developing this project.

This empirical study followed a qualitative approach methodology which offers a wider range of exploratory information accessing opportunities as well as affording a better description of the issues in question. Two case studies were selected Case (A) is Federal Government (FG) and Case (B) is Local Government (LG). The data collection methods used for these cases are mainly observation in Case (A) and in-depth interviews in Case (B) where the researcher evaluates three main elements: 1. Quality of Services, 2. Customer Happiness, and 3. Security.

The major findings that derive from both Cases identify four main challenges during the development of smart services projects in the UAE:

1. Understanding stakeholders' requirements in project phases.
2. Integrating the complex operations and services of Federal and Local Government
3. Building a collaborative team from different entities for large-scale ICT projects
4. Lack of efficient Data Protection technology

To conclude, these challenges generate some recommendations such as; involving stakeholders in large projects, creating a set of unified national laws and policies that are applicable to all

governments and organizations to apply open data and establish a security governance framework to protect smart city infrastructure. Also, they indicate many opportunities for future academic research in different aspect of smart services projects.

**Keywords:**

Smart Services Project, Smart City, Government Challenges, Stakeholders, Security, Quality of Services, Customer Happiness, Case Study.

## ملخص

تمكن النظام البيئي في دولة الامارات العربية المتحدة من خلال أنشطته المكثفة خلال السنوات الماضية من النمو بسرعة كبيرة مما جعله أكثر تعقيداً. يعود ذلك إلى عدة عوامل من أهمها الهجرة إلى المدن وكثافة أعداد الوافدين. وهو ما أدى إلى الحاجة الماسة لعمل تغييرات جذرية قادرة على مواكبة المتطلبات الناتجة عن الكثافة السكانية. ونتيجة لذلك فقد تولت الحكومة مسؤولية العثور على حلول مستدامة يمكن من خلالها تعزيز البنية التحتية للمدن وهو ما يوفر معايير عالية المستوى والجودة للسكان.

يستعرض الإطار النظري لهذا البحث مفهوم "المدينة الذكية" وخصائصها وتعريف المشاريع المرتبطة بهذا المفهوم كمشروع "الخدمات الحكومية الذكية" المطبقة. وسيتم تناول دراسة أجريت في كوريا الجنوبية تهدف إلى الحصول على معلومات أكبر في هذا المجال سعياً منا إلى الإجابة عن العديد من الأسئلة المطروحة والتي تتعلق بشكل مباشر بهذا البحث ولا تحمل إجابات واضحة. كما يهدف هذا البحث إلى استعراض التحديات المرتبطة بمشروع "الخدمات الذكية" في القطاع الحكومي في دولة الإمارات العربية المتحدة.

يندرج هذا البحث تحت إطار "التوجه النوعي" الذي يعطي رؤية أشمل وأكبر من المعلومات ويمكن من خلاله تقديم شرح أفضل للمسائل المتعلقة بالموضوع المطروح. تم اختيار حالتين للدراسة: الأولى (أ) وهي الحكومة الاتحادية (الفيدرالية) والثانية (ب) وهي الحكومة المحلية. تم جمع البيانات من خلال المشاهدة (الملاحظة) في الحالة (أ). أما في الحالة (ب) جمعت البيانات من خلال مقابلات أجريت على أفراد وقد قيمت تبعاً لثلاث عناصر وهي: (1) جودة الخدمات (2) سعادة المستهلك و(3) الأمن.

أما نتائج الدراسة الخاصة بحالتي الدراسة التي تم إجراؤها فإنها تستعرض أربعة تحديات رئيسية تقف أمام تطوير الخدمات الذكية في دولة الامارات العربية المتحدة وهي:

1. فهم متطلبات الأشخاص ذوي العلاقة (أصحاب المصلحة) بالمشروع.
2. دمج العمليات المعقدة والخدمات التابعة للحكومة الفدرالية والحكومة المحلية.
3. بناء فريق متعاون من مختلف الفئات للمشاريع الضخمة.
4. عدم وجود تقنيات أمنية متطورة لحماية البيانات من الاختراق.

وعليه فإن حلول لمواجهة هذه التحديات تكمن في عدد من الاقتراحات الهادفة مثل اشراك الاشخاص ذوي العلاقة فيما يتعلق بالمشاريع الكبيرة في جميع مراحل المشروع، ووضع قوانين موحدة تطبق على كل الحكومات والمؤسسات لتسهيل عملية تطبيق الخدمات الذكية، إضافة إلى تطوير نظام أمني حكومي يحمي البنية التحتية للمدينة الذكية وتوفير العوامل اللازمة لعمل دراسات حول هذا الموضوع في المستقبل.

الكلمات المفتاحية:

مشروع الخدمات الذكية، المدينة الذكية، تحديات الحكومات، الأمان، جودة الخدمات، سعادة المستهلك، حالة دراسة، أمن المعلومات.

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

” وَقَالَ رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَىٰ وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ (١٩) ” – القرآن الكريم – سورة النمل

In the name of Allah, the most gracious, the most beneficent.

“My Lord, direct me to be thankful for the blessings you have bestowed upon me and upon my parents, and to do good works that please you. And admit me, by your grace, into the company of your virtuous servants (19).” Holy-Quran Surah An Naml.

First and foremost, I would like to thank my God, Allah, for his always support to enable me to accomplish my goals in this life.

Indeed, this dissertation work would not been completed without the support of several individuals. Thus, I would like to express my gratitude to the supervisor of this research dissertation, Professor Ashly H. Pinnington, for his fruitful guidance and advice to complete this dissertation.

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# **Chapter 1: Introduction**

## **1.1 Research Overview**

“Smart” is a word often used to represent a combination of inner abilities of an individual. Reflecting on the past, the use of the term smart considers theories and idealistic plans that were proposed as future dreams and utopias enabling humankind to live in a much happier and most importantly, smarter way. Over the past few decades, these ideas of smarter societies have developed into potential plans with tangible outcomes that never cease to amaze us as we continue to rapidly implement tremendous changes and apply highly advanced technologies. Interestingly, the idea of living smart is established in accordance with the present understanding of modern technology. While it is reasonable to assume that our ancestors lived “smartly”, what we consider to be “smart living” today will be considered old-fashioned in the future. It is true that the concept of living a “smart life” is not exclusively identified as occurring in just one era but rather can be understood as the maximum utilization of the available resource components, for example, technology and efficient labour) in an optimal manner and, most importantly, in a smart way.

The Smart concept’s evolution in the United Arab Emirates begins when oil and gas was a major contributor to its economy. However, in mid the 1990s, the UAE’s visionary leaders recognized the necessity of diversifying the economy to reduce the reliance on oil by establishing policies that embrace other economic resources and industries such as trade, tourism, real-estate, and services. By realizing this phenomenon of diversification, it becomes crucial for organizations and institutions to enhance the efficiency of their customer services to become and remain competitive. Therefore, the UAE has gradually engaged into more services and making quality improvements

towards a knowledge-based economy throughout different sectors. The leaders of the country are emphasizing developing a quality platform for the UAE through setting up a number of strategic and forecasting services functioning on a macro-level of quality and excellence (e.g. Annual Government Summit, Government Excellence Awards and Conferences.). In addition there are a range of other initiatives such as creating international excellence frameworks, recognition programs, standards, e-Government initiatives, research and key partnerships with quality-focused associations and institutions. These initiatives have accelerated the race for quality, productivity, customer experience and competitiveness in the UAE during the last two decades particularly in federal and local government departments and sectors.

According to the UAE annual economic report (2013), the GDP (at constant price) for UAE reached AED 981 Billion in 2011, the GDP comprising a share of AED 674.8 billion from the non-oil sectors and AED 440 billion on from Service activities comprising of Wholesale, Retail Trade, Repair Services, Real Estate, Transportation, Storage, Communication, Financial enterprises, and Government services. Promoting the excellence service scheme standards across the nation boosts the idea of e-Services as the next major wave of quality development since the beginning of 2000s. Excellence in e-Services is dependent on Information and Communication Technology (ICT) that influences how customers interact with service providers, thus ICT attempts to modernize business process management, customer service and quality performance.

Considering the potential use of ICT in developing services, in 2002, the Dubai Government 2002 declared a series of inclusive electronic transformation initiatives including e-Government that create government services available through internet. Further, Dubai's e-Government initiative

led to a radical leap in service delivery and customer service in Dubai. As a result, the delivery of government services through internet has been adopted in other Emirates. However, as the extensive use and reliance on smartphones and IT tablets and cities ecosystem becomes more complex worldwide, the word “smart” comes to the front of the picture. Hence, the UAE announced a pioneering Smart Government initiative in 2013 by transforming all government services to be made available on mobile devices within a period of just 2 years, unleashing a new era of customer service and experience. The UAE’s leaders visionary intention is to concentrate on augmenting the e-development policies and keep pace with best international practices in this field.

## **1.2 Statement of the Problem**

As the UAE’s ecosystem becomes more complex where operating activities increase due to the migration of citizens to cities and growth in the size of the expatriate population, the overload on activities and associated resource demands have become major problems. The current government’s performance depend on expanding their services through opening more branches to meet the needs of society, however, it could not remain on this path of continuously extending services provision through centers, shops and offices. Consequently, the government’s policy is to realize sustainable and agile solutions that will enhance the cities infrastructure and provide high standards of living. Thus, throughout this dissertation the researcher studies one of the aspects of the smart city concept in the UAE through examining smart services projects implemented in the public sector. This research seeks to understand how smart ideas and practices play an effective role in offering quality of life for citizens and identify the challenges which occur in smart services provision.

### **1.3 Research Objectives and Aim**

This dissertation explores the application of smart services in the Middle-East region. The development of smart services in the UAE is a good example to implement the following objectives for this research:

- To explore the challenges that encounter in Smart Services Project in Government Sector.
- To understand the benefits of applying smart services to society.
- To identify project stakeholders' effectiveness in developing smart services project.

### **1.4 Research Questions**

In order to achieve the research objectives, this dissertation addresses the following questions to be considered during this study:

- What difficulties are encountered during the development of Smart Services (SGS) in the UAE Government?
- How does implementing Smart Government Services (SGS) relate to the Smart City concept?
- How do stakeholders play major roles in developing Smart Government Services (SGS) in the UAE?

## **1.5 Structure of the Dissertation**

This dissertation begins with a literature review that introduces the evolution of the term “smart” and “smart city”. In the literature review, city core systems and smart city classifications that contribute mainly to this topic are described. Further, it describes and assesses smart government services projects understood technically and from project management perspectives. The next chapter describes the research methodology and framework used for the research design, data collection and analysis in the selected field.

Then, the following chapter presents the main findings and results arising from two empirical case studies that were conducted in the public sector; one is Federal Government (FG) and other is Local Government (LG). These findings along with the literature review were interpreted in the Discussion chapter to answer appropriately the research questions. In addition, the literature review contributes to this chapter to arrive at making some recommendation for development purposes which are grounded in the case study and based on knowledge from the existing literature review. Finally, the last chapter concludes and summarizes the key findings mentioning the main limitations of this study and making suggestions for future research in this field.

## **Chapter 2: Literature Review**

### **2.1 Introduction to the Smart City Concept and its Evolution**

Unfortunately, it is widely indicated that the current capabilities of internet structure is not sufficient to face the upcoming and future challenges. That is why, introducing the true and actual meaning of “smart” does not necessarily involve the aspects of these components that are available in the present but rather the way they work and interact together. Understanding that will allow not only identifying the smart way of living but it will also enhance the way of employing this concept to be brilliantly used in the future to its maximum level at any period of time.

Despite the common use of “Smart City” in the agendas of policy makers nowadays, the exact and a shared definition of smart city becomes difficult to identify as a common global trends (Chourabi et al., 2012). However, some researchers demonstrate the concept of smart city from different perspectives. For instance, Karadag’s thesis (2013) elaborates “smart” as “a combination of different components such as; attention, memory, producing, understanding, learning, reasoning, problem solving and decision making that are working together, taking haste actions to make an efficient decisions”. While the following represent other studies that reveal some interesting concepts of smart city in term of enhancing the quality life of citizens:

- “A city connecting the physical infrastructure, the ICT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city” (Harrison et al., 2010).
- “A city that invests in human and social capital and traditional and modern (ICT) communication infrastructure in order to sustain the economic growth and a high

- quality of life, with a wise management of natural resources, through participatory governance” (Caragliu et al., 2009)
- “A city whose community has learned to learn, adapt and innovate. People need to be able to use the technology in order to benefit from it” (Coe et al., 2001).
  - “A city that reflects a particular idea of local community, one where city governments, enterprises and residents use ICTs to reinvent and reinforce the community’s role in the new service economy, create jobs locally and improve the quality of community life” (Anttiroiko et al., 2013).

On the other hand, the development concept of the “smart” cities derives from major scenarios that reflect negatively on city core systems. Current cities become systematically complex because of the massive numbers of interconnected citizens, businesses, different modes of transport, communication networks, services and utilities. Based on study conducted by Caroline, Sonya & Joseph (2013), there are actually six main systems of the city, demonstrated below:

**People System** – focuses on citizens, community and social groups which can be considered the infrastructure of the city. This system ensures that the society maintain the optimum safety, education and health care.

**Business System** – highlights the regulations and policies that are related to trade and business life (e.g. legislative and administrative regulations about national and international trade, investment, labour markets, product markets and intellectual properties).

**Operational System** – refers to the legislative administrative and financial provisions over the city operational for instance, establishing transport system modes (e.g. public transport network, harbors and airports) that link people either in the city or between different cities.

**Communication System** – refers to the intangible communication such as; telecommunication infrastructure (e.g. mobile systems, web based application, wireless networks, voice response [IVR], Interactive etc.)

**Water System** – aims to have the best practice to raise the efficiency and utilization of water management (e.g. capacity, quality control and regulations).

**Energy System-** concentrates on the best practice to deploy the energy (e.g. renewable energy, decentralized energy production).

Some of the previous systems can be considered as major challenges toward smart approaches. Recent studies declare that one of the main drivers of smart policies and systems is having astonishing growth of population and urbanization expansion in the last decades. Where 50% of people apparently begin to reside more in cities than rural; this phenomenon perception encounters for the first time in history in 2010 (Bieser, 2013). Yet, most researchers believe that this proportion is expected to increase to 70% by 2050 (Bieser, 2013). On the other hand, the sudden inflation of global urbanization at the beginning of 21<sup>st</sup> century creates great challenges for societies. Most communities used to rely on “industrialization” principle for human development; where its functions concentrate on increasing productivity consistency regardless the sequences. In other words, the high level of competition in the developed cities leads of having most skilled individuals migrate from countryside to cities. However, the industrial revolution has serious impacts on dealing and managing the natural resources optimally (Steffen et al. 2011). The human actions integrate adversely on environment and earth sub-system (e.g. water and energy systems). Water system is responsive to the economic and demographic changes of the developed cities. Hence, the sequences in increasing population create a significant surge in water demand; this might create

shortage in the future and will eventually lead to slowing down the economic growth as it will create pressure on food prices. Moreover, this series might extend to transportation such as causing heavy traffic, lack of parking spaces, and increasing environmental pollution. These causes reveal that human behaviors might impact on future generations' capability to meet their needs (O'Brien, 1999). This can be an indication that humans are facing systematic sustainable challenges that require enormous changes in human activities (Ny et al. 2006). Accordingly, applying the much desired solutions requires certain data collection in order to formulate the right plans and procedures against the faced challenges. Therefore, the conspicuous rise in demands among residents emphasis on smart approaches to cope with the radical changes (Buscher et al., 2010; Larson, 2012).

## **2.2 The Characteristics of a Smart City**

In addressing these challenges, the concept of “smart city” programs becomes center of attention across the world. Citizens need to transform from this principle to become more “mobility”; the population growth and increased urbanization raise a variety of technical, social, economic and organizational problems that tend to jeopardize the economic and environmental sustainability of cities where the rapid growth faced by several cities has generated traffic congestion, pollution and increasing social inequality (Lee et al., 2012). Therefore, to decrease their commuting distances, lower pollution and utilize resources efficiently, governments and corporations need to develop intelligent solutions (Hodgkinson, 2011). Concurrently, these conundrums emphasize cities to take an advantage of changing their strategies to leverage their potential opportunities of city growth to pursue sustainable solutions that utilize natural and alternatives resources efficiently to maintain desired sustainable socio-economic outcomes and high quality of life for citizens.

Despite the varieties of literal meanings of the word smart, recent studies attempt to introduce the definition of smart under new form of “Smart Cities” to distinguish between the key characteristics of “Smart Cities” and others that use urban elements and functions to illustrate this notion from urban perspectives. The previous city core systems can reflect on one or multiple components of “Smart”. However, these factors of smart city can be classified and interconnected with city core systems into three categories: [1] Technology, [2] People and [3] Institution. One crucial element in distinguishing smart cities lies within the use of information and communication technologies upon which the infrastructure is based in a way that allows, smartly, for efficient operations, flexible procedures and sustainable conditions. Therefore, “Smartness or intelligent can be defined as the ability to use the information and turn them into knowledge by the help of information and communications technologies”.

While the concept of Smart Cities is widely defined and related to several criteria, Toppeta (2010) emphasizes the importance of combining information and communication technologies (ICT) with urban planning to find efficient solutions which contribute to the city objectives of increasing sustainability and promote socioeconomic development that improve the livability for its citizens. Also, the model inspires both Caragliu et al. (2011) to enhance the concept of smart city by defining it as “when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance”. Thereby, Dawes and Pardo (2002) state that city can be smart only “when governments invest in these areas for development to lead to sustainable growth and enhanced quality of life for citizens”. It is important

to refer to the definition designed by Caragliu et al. (2011) as it is based on City Model Figure 1, developed by Giffinger et al. (2007) where it represents a classification system that demonstrates six distinct characteristics.

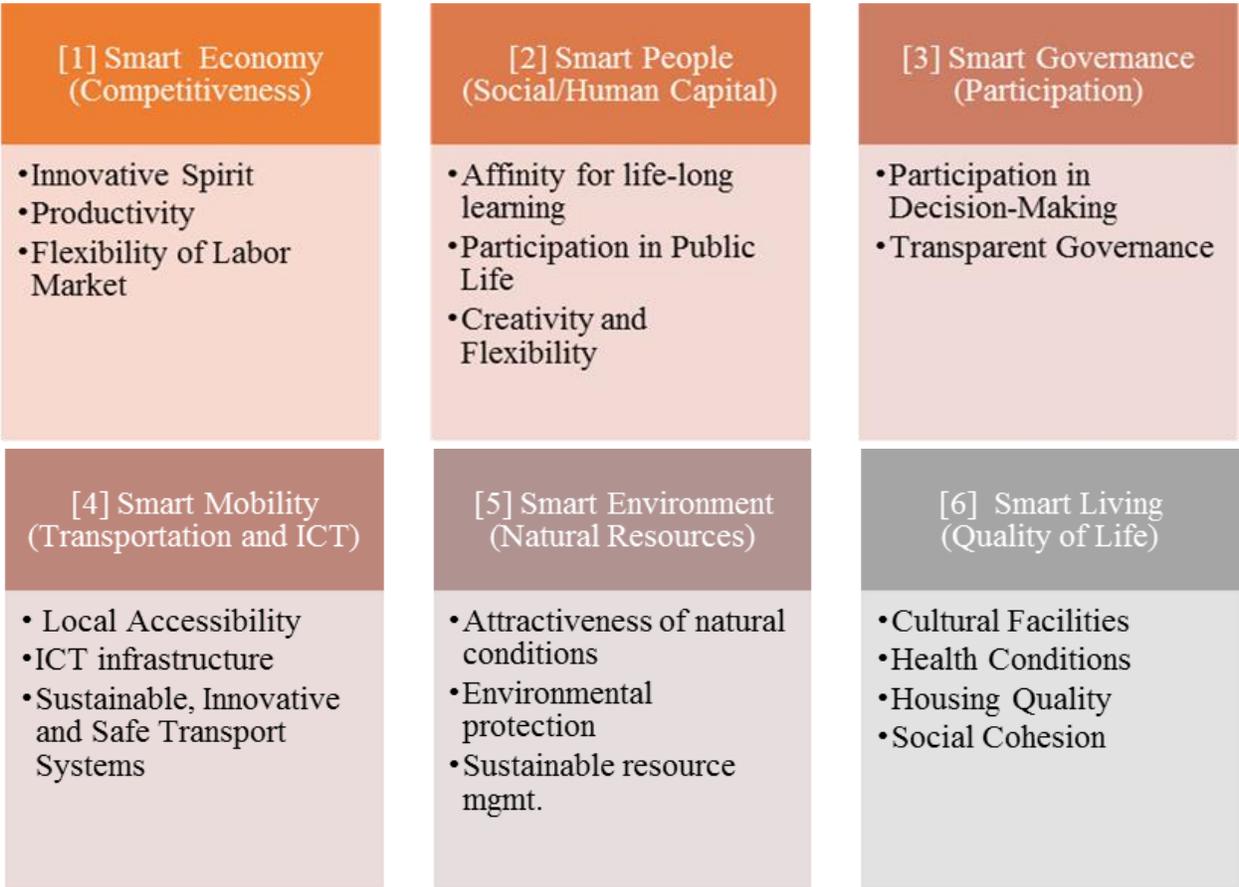


Figure 1: Smart Classifications Model (source: Giffinger et al. 2007)

It is a model under which a city is examined in order to determine the factors and conditions required to allow the city in question to turn into a smart city (Giffinger et al. 2007). Furthermore, this model is considered as a tool to examine and evaluate the current state of the city and identify the areas that cities need to develop in order to go “smarter”. Also, it can be used as a target-model given its unique nature and interesting vision highlighted by the criteria detailed below:

**Smart Economy (Competitiveness)** – refers to initiating creative approaches and idea in business generating a high level of competitiveness under which productivity and markets are outlined by the “smart” utilizing of labour in terms of knowledge, experience and skills. Basically, it is a long-term vision that is defined in achieving profitable investments and successful economy plans.

**Smart People (Social/Human Capital)** – refers to the delivery system under which citizens are delivered consistent education, social interaction, cultural awareness and open-mindedness. In general, this term is defined by living smartly in a way that is compatible with the smart economy system.

**Smart Governance (Participation)** – refers to the governance system that generates strategic plans and sustainable public services that are being operated efficiently and economically. Furthermore, it allows citizens to play a definite role in decision-making, given that accessing management information and the relevant data is available. Not only does this interacting system strengthen the ICT infrastructure but it also enhances collaboration and communication between the citizens and the government within the society.

**Smart Mobility (Transportation and ICT)** – refers to the transportation system that enables efficient and smooth transportation that requires utilizing the vehicles economically in a way that reduces the usual inconveniences associated with mobility in cities and urban sites.

**Smart Environment (Natural Resources)** – refers to the smart interaction between citizens and their surroundings in terms of environmental aspects (e.g. pollution, emission reduction). Not only does it enhance the nature of the city but it also promotes health solutions, reduction of energy consumption and incorporating innovative technology.

**Smart Living (Quality of Life)** – refers to the welfare of the citizens of the city in terms of interactive social, accessible health services and available security benefits.

Defining smart city characteristics, this dissertation attends to one smart city framework element which is smart government, where government plays a vital role in leading and coordinating smart city initiatives and efforts.

### **2.3 Defining Smart Government Services (SGS)**

The concept of a smart government consists of two dimensions: public service management and local government administration. Pardo et al. (2011) consider a smart city in the aspect of government management as enhancing efficient, effective management both in front-office and back-office operations of city government. They define managerial innovation of a smart government as “a mechanism to create managerial and organizational capabilities for effective use of technological tools and conditions”. While, other studies describe a city service system as “the operational activities and coordination of service delivery provided by the city authority” (Lee et al. 2014). According to 20th GCC E-government and E-services conference (2014), a comparison between smart city and smart government have been conducted to clarify the major differences based on: major drivers, roles, geographical and vertical focus, technology coverage and approach. As for Smart city, the main drivers are economic development, competitiveness and environmental sustainability where it focuses on multiple domains in one tier (city) that are usually lead by private stakeholders, technology and enterprise service providers etc. Further, smart city technology coverage focuses on connecting city systems based on ICT and instrumentation infrastructure and smart government practices. Whereas, smart government major drivers are concern on public values with one or multiple domains in multiple tiers that role by government organizations in any tier, buyer or consumers. In addition, smart government technology domains are more into

business processes and technologies to ensure flawless information across government organizations. Approach speaking, smart city is mostly up-bottom approach in which usually lead by prime minister, while smart government is bottom-up which lead by necessity and whom it may concerns. The smart city model which conducted by Giffinger et al. (2007) accentuate smart governance as a larger category including a smart government where smart governance component comprises participation in decision making and transparency. Further, Walravens (2010) believes that efficient management of city operations and effective delivery of city services as key to smart government through an efficient city administration that provides services to its citizens and fosters businesses essential to today's service-based economy.

One of the crucial components to develop managing city operations is using communication and collaboration technologies to deliver these services among city departments and enabling nongovernmental organizations to participate in decision making and monitoring of service delivery. Thereby, smart government services remain the platform at which the relationship between the citizens and their government is being sustained. This fact can be identified through a number of modes that manifest themselves in an electronic form that include: (1) “e-administration”, in which services needed for administration of the public are personalized for the consumers, (2) “e-government” which refers to the functioning policies within the city, (3) “e-governance” in which the citizens play active roles in government policies and agenda, and (4) “learning city” which refers to the learning mechanism developed by the citizens (Lee et al., 2014). Some researchers describes smart government as “Smart government integrates information, communication and operational technologies to planning, management and operations across multiple domains, process areas and jurisdictions to generate sustainable public value” (Gartner,

2014). Where this concept represent as an advanced government that gives the opportunities for society to avail themselves to access into several services anytime, anywhere and with any device under convergence and integration of smart IT and government. However, it is worth mentioning that not all smart government services are being used to the full capacity. That is because the mere concept of a smart city covers eleven categories of smart city services which are: administration; transportation; public health, medical care & welfare; environment; crime & disaster prevention; facilities management work & employment (Lee et al. 2012). In other words, getting the maximum benefits and best utilization of each category would demand more than currently can possibly be made available from the government.

It is worth noting that the concept of smart cities expands in terms of terminologies to include names such as information city, intelligent city, knowledge city and many more. Furthermore, the performing of a smart city covers six characteristics: smart economy, smart people, smart governance, smart mobility, smart environment and smart living. The concept has even the capacity to include even more features such as human capital and education. Accordingly, the concept of smart cities widens to cover far more aspects than one might think. This is due to the variety of perspectives and approaches by different cultures which would naturally reflect the relevant fields of technologies. This leads to the fact that not all smart cities are functioning equally. However, it is important to point out that the common, and rather necessarily required, aspects are essentially constructed to improve the citizens' quality of life and these include the efficient implementation of green technologies, developing the communication and information field and improving the environment. These smart city services are provided via the city's infrastructure based on ICT technologies, the city managers are continuously aiming to enhance

the citizens' sustainable quality of life through the “upgraded” smart services which means innovative usage of the ICT in city planning and management.

## **2.4 Smart Government Services (SGS) versus Security Risk**

However, given all the desired aspects of smart cities in terms of functioning and developing, it is important to point out the most crucial criteria that should be found in multiple forms and that is security, particularly, security in the digital world. It is unfortunate that nowadays we live in a world where the lack of privacy is fairly common (Francis et al., 2007). That is because penetrating the security system in the world of the internet can be done through huge varieties of harmlessly formed applications such as advertisements, programs or even spam that can be sent through email addresses. Needless to say, the difficulties lie within the main internet protocols and network architectures which paid little attention to the security systems. This leaves the users, who seek easy solutions and lack security experts, who are unable to identify – on time – potential threats that may be carried in any suspicious applications or other innocently looking approaches (Otero, 2015). It is why acknowledging the built-in security systems in the future internet has become a priority.

It is important to note that while shielding the internet against common threats, it is almost impossible to develop a security system that can face the unknown future threats, specifically to align with the complexity of smart ecosystems. However, a well-built security system can compensate by reducing any potentials threat that may emerge in the future. This can be done by understanding the mechanisms by which these attacks manifest themselves and predicting their course.

These threats have a multiple shapes and forms and anticipating their presence can be a real challenge depending on how experienced the users are. According to Lewis (2015), being smart means being advanced in mobility which lead to have more disruptive, examples of these disruptive would be Malware, Phishing and Fraud. These are one of the most dangerous threats which can cause serious economic problems. On the other hand, this underground economy keeps increasing the scale at which users are easily manipulated into falling as victims for the cunningly designed fraud plans, allowing the criminals to take full advantage of the faulty security systems which are not necessarily poorly built.

Unfortunately, a consequence of its flexibility, the internet can be accessed through multiple methods other than computers. Mainly, it can be accessed through mobile and smart phones. These powerful communication technologies are undeniably providing a powerful marketing tool that is changing and developing every day and consumers, almost all groups, are increasingly responding to this particular market. Mobile phones are no longer only providing the communication services, but they also provide entertainment, navigation, advertising and many more functions that attract all groups from almost all ages.

As systems grow to be more complex, interconnected and handled more information, in addition, City IT ecosystems increasingly be built on public sector cloud or infrastructure virtualization with social and mobile computing as the primary access for applications and services. Hence, this expansion of complexity of smart city technological and communication environment lead to be more vulnerabilities to cyber-attacks. About 40% of all fraudulent transactions came from mobile

devices (Gupta, 2015). According to Data Breach Investigation and Statistical Report (2015), 2,122 out of 79,790 security incidents occurred in organizations in different countries confirmed data breaches. However, the number of countries affected decreased from 95 to 61 countries which indicated that 34 countries improved the security of their technology networks. It is being stated that the most industries affected are Public, Information and Financial Services. Therefore, smart city infrastructures and services pursue for sophisticated protection strategies and develop solutions that leverage digital information to be designed from conception stage with consideration of aspects such as; security, reliability, privacy, information integrity and crucially resilience. These aspects are essential to ensure service continuity, safety and well-being for citizens by protecting against malicious violations, and unintentional damage. On the other hand, given the impossibility of providing an equal level of protection and resilience for every element in the ecosystem, city governance needs to identify the most critical areas that could attract or motivate attackers. Also, government with open data promote to manage ICT leadership and governance that aim to protect citizens' privacy and identities, since security and privacy are considered vital and sensitive government data that might impact on transparency and citizen participation. Legislation is another strategic approach established to ensure that the critical infrastructure is adequately protected from any kind of cyber-attack.

## **2.5 Case Studies of Smart Government Services (SGS) Project Worldwide**

As rapid urbanization caused severe pressure on cities traditional infrastructures, ICTs are considered to be one of the major elements that are capable of enhancing these infrastructures to reflect the massive demands of 21st century societies. Therefore, many of the globe major cities embarked on smart city projects such as Seoul, Hong Kong, Stockholm and Dubai. It is noticeable

that the evolution of smart phones creates a baseline expectation among many citizens. As smart devices allow the accessibility to information and services becomes feasible regardless of place or time, citizens become seamlessly accustomed to this new way of living. That is why technology vendors are embracing smart city technologies to meet up with citizens' demand providing the optimal solution that portray efficiency, quality and cost effectiveness in city services.

It is worth mentioning that smart city projects can be classified into three types: 1. New Smart City; build smart city from scratch, 2. existing city to turn smart; used by most cities, and 3. Purpose-driven cities that established with special purpose (e.g. Masdar- Abu Dhabi). The next section of this chapter examines one of the global cities that highlight challenges in implementing smart government services project by adapting their organizations to deliver smart services to their citizens.

### **2.5.1 South Korea – Smart Seoul 2015**

Seoul is the capital of South Korea and it is world renowned for its highly advanced economy and technology. According to ITU-T Technology Watch Report (2013), smart Seoul 2015 project announced in June 2011 led by Seoul Metropolitan Government to sustain Seoul's reputation as a global ICT leader by advancing its sustainability and competitiveness through smart technologies. However, smart Seoul is not Korea's first attempt in city development as in 2004, Korea launched U-City project whereby universal computing technologies were applied to strengthen cities' competitiveness. Yet, Smart Seoul 2015 adopted to overcome the limitations of U-Seoul which applied ICTs to existing "traditional" city infrastructure. Despite the significant influence of U-Seoul in enhancing the delivery of service such as; transportation and safety, yet it failed in providing the quality of life enjoyed by citizens. Hence, Smart Seoul 2015 project is more human-

centric which focus on implementing as many smart technologies as possible and create interaction between city and citizens. Most of cities concentrate on three traits as priorities when a planning for a smart city project:

- **ICT Infrastructure:** developing secure ICT infrastructure is one of the critical trait to success in emerging smart services.
- **Integrated City-management Framework:** defining framework to build-block systems that work in harmony through strict adherence to common standards.
- **Smart Users:** ICTs are meaningless tools without smart users that are able to interact with smart services, thus, increasing access to smart devices across different age groups and educating new users is one of smart city's priorities.

Moreover, ITU-T Technology Watch Report (2013) mentions that Seoul developed several smart initiatives subprojects which target the infrastructure, government and citizen, some of these enterprises target infrastructures are “Smart Devices for all” and “U Seoul Net”. Smart devices for all is a project where smart city depends on inclusive network of smart device users, the key pillar for Smart Seoul 2015 is to extend the access domain of smart devices by installing free Wi-Fi networks in different areas in the city (e.g. parks, subways, squares and other public places) plus creating public-private partnership to ensure the required high-speed of the internet in the smart city context. Although, increasing the range of access of smart devices will increase the perception of smart services users. Yet, Seoul needs to consider the low-income family and others who do not obtain smart devices. Taking this issue into account leads to creation of the idea of “Device Donation”. As the high-speed accelerating in ICT market, which allow typical smart device users to buy new products within the useful lives of the devices they are replacing. Hence, government

encouraged citizens to donate their old devices when buying new ones by tax deduction in the range of USD 50 to 100 per device donated. Then, government is responsible for inspecting and repairing the donated devices by manufacturers to distribute as free of charge to the vulnerable segment in society such as beneficiaries of Korea's National Basic Living Security.

Another aspect where Seoul foreseeing is the capability of smart devices to approach different vulnerable groups which are impaired either financially or physically. One of the notable approaches is providing mobile device application for hearing impairments by dialing 120 which reaches "120 Dasan Call Center" via video-call application. The other initiative is "U-Seoul Net" which is a communication network project dedicated to smart services to overcome the limitations of the previous optical network "e-Seoul Net" that established in 2003 to connect public offices and for administrative data exchange purposes without involving or allowing access for Citizens. This network is not equipped to support new smart services and the massive volumes of data flowing over a smart-city network. Therefore, U-Seoul Net is initiated to overcome these restrictions through providing full free Wi-Fi service and access to public web sites and services for Citizens anytime, anywhere. This enables municipal government to handle huge amounts of data generated from different smart devices. On the other hand, U-Seoul Net contain three communications sub-networks: a Wi-Fi for administrative functions; CCTV enabling exchange video data generated by Seoul's CCTV installations; and U-Service network which connects the websites of all public and offices under Seoul Metropolitan Government. Others notable initiatives that target government development as well are "Open and Disclosing Governance Data" and "Developing Public Applications".

## **2.6 The Role of Stakeholders in developing projects**

The development of large-scale ICT projects such as Smart Services in government may involve various stakeholders. The restricted time spans and constraints that face many projects may pose various challenges in developing relationships among stakeholders likewise project teams (Massaoud et al., 2008). Stakeholders are considered as fundamental key success criteria in project management, specifically in massive projects that are socio-economical related which usually are influenced by diverse parties in the external environment who are interested in these kinds of projects (e.g. society, citizens and governments) (Liisa, Ruuska & Ahola, 2013). Hence, it is important to address stakeholder terms and influences to capture its effectiveness on project management (Aaltonen, 2010). Thirty years ago, Freeman (1984) defined the stakeholder approach as concentrating on any “group who affect or affected by the focal organization or project”. Regardless of their direct or indirect role in the project, stakeholders play a major role in the success of project deliverables. A large number of project failures are reported as arising from unresolved problems and tradeoffs made amongst project stakeholders (Cleland, 1985). This has encouraged researchers to analyze the practices of stakeholder management when executing a project using international standards such as PMBOK (PMI, 2008).

Most of these standards are developed by practitioners based on their experiences across organizations and industries (Ahlemann et al., 2009). In addition, many researchers emphasise categorizing stakeholders (Mitchell et al., 1997; Mathur, 2008; Frooman, 1999). However, due to the complexity of building a comprehensive theory to cover all types of stakeholders, most studies desist from concentrating on all potential stakeholder groups. In numerous multiple stakeholder settings, Freeman (1984) observes that government influence on business and projects has notably

increased. In fact, several studies argued that government does not relate to any typical stakeholder categories (Fassin, 2009, Neville and Menguc, 2006). Therefore, to identify stakeholders, Frooman (1999) suggested that researchers define stakeholders through three questions: “Who are they? What do they want? How are they going to try to get it?” Where these questions arouse attention in discovering whether there are some particular features associated with the type of stakeholders that might be related to governments and have significant influence on projects. Thus, the term governmental stakeholder has been introduced (Sallinen et al., 2011).

According to researchers, the governmental stakeholder usually is seen through entities such as government bodies, government actors, states, authorities, legislators, regulators, regulating agencies and regulatory institutions (Miller and Hobbs, 2006). Furthermore, Sivonen (2009) explains that government usually use organizations, such as regulators, legal authorities and central government departments, to monitor economic activities and supervise the interests of society. As a result, the scope of the definition of governmental stakeholder covers those organizations (Sallinen et al., 2011). The role of the government stakeholder in projects is frequently more concerned with moral and ethical motivations (Smyth, 2008), where government stakeholder regulators represent citizens’ interests, the general public and society as whole. This indicates that government stakeholders do not have purely their own stake but rather represent others’ interests. In fact, stakeholders may complement each other’s stakes yet, the stake of public and government stakeholders may not be the same (Neville and Menguc, 2006).

It is worth noting that the stake that government stakeholders can have in projects may consist of both moral and legal contributions. That is why, Fassin (2009) stated that any focal organization

can be ordered by government to take certain responsibilities that are within government regulations and laws which might have either positive or negative influence. In other words, the impact of government stakeholders on projects that are lead by any organization takes place through limiting or refusing resources which can cause increase in costs and delay project schedule (Olander and Landin, 2005). For instance, if a project is spontaneous and follows regulations without steering from a government stakeholder, project monitoring can be lighter, while if it derives from a governmental stakeholder, this can reflect negatively on the project where it requires more monitoring activities and extra stages to be included in the project timeline and scope. Contrastingly, governments can play a vital role in engaging firms to participate in the making of regulations which lead them to obey regulations afterwards.

Pernille & Martina (2013) argue that it is crucial for citizens to be engaged in the design and execution of new systems and many methods have been developed to engage users in designing phase of the ICT projects. Nevertheless, involving users in developing designs on a large-scale in government is difficult. Hence, government stakeholders often communicate and advertise to society on behalf of the project (Fassin, 2009). As one study proposes the designer's point of view is not enough to achieve the desired outcomes of the project (Pernille & Martina, 2013). Since, overlooking stakeholders may cause missing some requirements that might lead to producing the wrong product. Thus, to ensure acceptance, trust and efficient use of these systems it is an essential requirement that project designers consider carefully from a social informatics perspective who are the users of this project.

## **Chapter 3: Research Methodology and Conceptual Framework**

### **3.1 Overview**

This research illustrates the evolution of smart government services project in UAE, where this enhancement reflects on both government and society in different approaches. Therefore, an empirical case study is conducted in two government sectors one is federal government (FG) and other is local government (LG). The research methodology and framework is designed to capture the complexity of various elements that require being explicative in these two cases. Thus, this chapter explains and justifies the selected research approach and methodology for achieving the purpose of the study.

Irny and Rose (2005) defines research methodology as a systematic or hypothetical analysis for data which collected by applying different techniques to the field of study. This section is considered the fundamental part of the dissertation where the validity of a study is ultimately judged. There are two main approaches for research methodology namely: Quantitative and Qualitative. By understanding some aspects to differentiate between these two approaches will determine the optimal research approach for this study. Trochim & Donnelly (2008) states that the quantitative approach focuses on deductive or top-down reasoning which tends to move from general to specific. Usually, this approach is pre-determined by identifying the relevant theory and then stating and testing hypotheses by converting the collected data to numerical form to generate statistical analyses and evaluation. However, the qualitative approach inclines to be inductive and follow bottom-up reasoning which means moving from specific to general. This approach is based on collected data methods which is qualitative, for example, observation, interviews and focus

groups. It develops either a theory, problem or explores a topic (Trochim & Donnelly, 2008). In other words, it tends to maintain more flexibility and realise opportunities to address additional issues. However, both approaches can be used either simultaneously or separately such as the first approach is used then the next approach is followed in the second part of the study. For instance, a qualitative study involving in-depth interviews or focus group discussions might serve to obtain information which will then be used to contribute towards the development of an experimental measure or attitude scale, the results of which will be analyzed through statistical methods and techniques.

### **3.2 Selection Criteria of the Research Approach**

In order to develop an effective research design and select a worthwhile approach, research questions are developed and addressed based on a literature review and knowledge obtained on this topic. Some general research questions important for this study include:

- What are the difficulties encountered during the development of Smart Government Services (SGS) in the UAE?
- How does Implementing Smart Government Services (SGS) Benefit Society?
- How do Stakeholders play major roles in developing Smart Government Services (SGS) in the UAE?

To answer these research questions, the study selected the qualitative approach – inductive methods that begin with observations and then formulating a theory at the end as a result of these

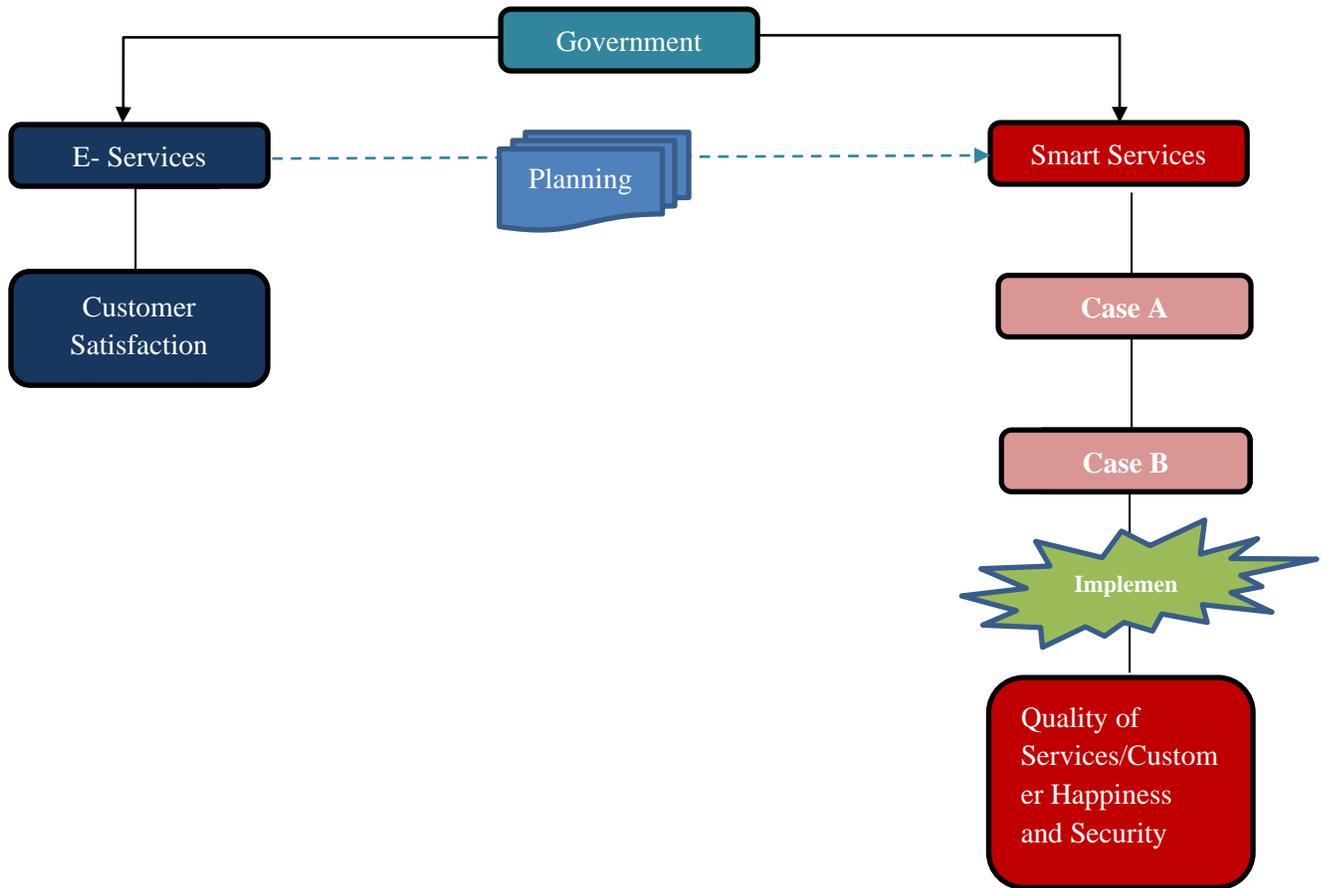
observations (Goddard and Melville, 2004). Bernard (2011) defines this bottom-up approach by “involving the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses.” In other words, the researcher tends to develop empirical generalizations based on learning from experience and then develop theory throughout the progression of the research. This gives the opportunity for the researcher to direct the nature of the findings after the study is completed. Thus, the researcher uses observations to describe a picture of the phenomenon that is being studied. To conduct such an in-depth observation, a case study scheme led in two government sectors, the case study is one of the qualitative approaches that refers to a group of tools and techniques (e.g. participant-observation, in-depth interviews, and longitudinal studies) which emphasizes qualitative analysis (Yin, 1984). The case study approach seeks a detailed understanding of the problem in the specific contexts that it is being investigated. It provides the opportunity to ask penetrating questions and to capture the richness of organizational behavior using a variety of the mentioned techniques available in this approach, but the conclusions drawn may be specific to the particular organizations studied and may not be generalizable (Gable, 1994). One major reason for selecting this approach is its capability of illustrating a case from different angles which gives an insight into a particular case. In other words, to triangulate by combining methodologies which vary from presenting individual cases to develop a theory or explanation of the phenomenon (Groat and Wang, 2002).

### **3.2 Research Conceptual Framework and Design**

The following framework describes the instrument that this dissertation used to examine two cases conducted in two government sectors. The first Case (A) is about a Federal Government (FG) that regulates Information Communication Technology (ICT) in the UAE. This case focused on addressing the road mapping and strategic planning phase to overcome the challenges in transferring from electronic government to smart government services projects in the UAE. The challenges are identified via assessing and analyzing the current position of the UAE's performance in this particular field (e.g. quality of service, security infrastructures).

The second Case (B) examined a Local Government (LG) that provides Utilities and Public Services to society. This case study illustrates the impact of the planning phase studied in Case (A) in practice. This is achieved through investigating and observing in depth the execution of smart government services and understanding the influence of this project from government and society perspectives.

In addition, these two case studies will raise the issue of whether the desired outcomes of this project are accomplished and aligned with the leadership vision and aims in terms of not only moving services to be smart but achieving their main concerns of changing customer's level of gratification from satisfaction to happiness.



**Figure 2: Research Framework and Design**

### 3.3 Research Data Collection and Analysis

In order to conduct a qualitative approach research efficiently, there is a need to collect, analyze, and interpret qualitative data in one or number of case studies, where an investigation of the same phenomenon is under consideration. Thus, data resources are collected from government sectors using two main techniques both case studies. First, an in-depth interview technique is used to stimulate a vivid picture of the participant’s perspective on the research topic. Depth interview is considered an effective qualitative method for people talk about their personal feelings, opinions,

and experiences. It gives opportunity to gain insight into how people interpret and order their world. This can be accomplished by being attentive to their different accounts and descriptions of phenomena, including their causal explanations. As a general principle, when using in-depth interviews in a supportive manner that concentrates on their perspectives, the participants are more confident, more relaxed they feel more encouraged to express the deepest thoughts about the topic. Hence, the information gathered with this qualitative method is often relevant and valuable.

Conducting in-depth interviews and observation in Case (B) was considered essential by the researcher for exploring and analyzing the following key elements before and after implementation of the project that will capture stakeholders' role in developing smart services in the UAE:

1. Customer Satisfaction/Happiness
2. Quality of Services
3. Security

### **3.4 Summary**

This chapter identifies the advantages of adopting a qualitative approach to develop this research dissertation using case study methods. As this method contributes in exploring two cases in different government sectors by using a variety of tools such as, in-depth interviews, observation and documents provided from these two government organizations. To follow the objectives of this dissertation

, three elements were measured: Customer Satisfaction/Happiness, Quality of Services and Security. Using these key elements, it is possible to measure UAE government performance before and after implementation of the smart services projects.

## **Chapter 4: Data Findings and Results**

### **4.1 Case Study (A) Federal Government Sector (FG)**

A case study conducted in one of federal government sector named (FG) that regulate the Information Communications and Telecommunications (ICT) in the United Arab Emirates (UAE) to ensure sustainability, competitiveness and transparency among the service providers, customers and shareholders. This case study gives an overview of the roadmap and initiatives for UAE smart government services project that are foreseen in some aspects of the recent leadership vision and direction towards smart city. However, in order to understand the transformation from e-government to smart government, it is necessary to mention the feasible studies that steered to determine the priority requirements to achieve smartness. Through this case study, (FG) stated its concerns with the vision of the recent leadership that set a deadline for all governments to turn to smart in 24 months in 2013. His Highness Sheikh Mohammed Bin Rashid Al Maktoum stated his vision in the annual government summit (2013):

“I want it a government that toils twenty-four hours a day, just like airlines, I want it to be close to people, welcoming all clients akin to that welcome received by hotels’ guests; I want the citizens to be able to process all their government transactions in one place, on a one-mobile stop shop”.

### Today's UAE Government



- Various transformation **approaches and methods**
- **Increasing adoption of portals** and mobile applications for service
- Growing need for **integration and information sharing**
- More focus on prioritizing **services for modernization**

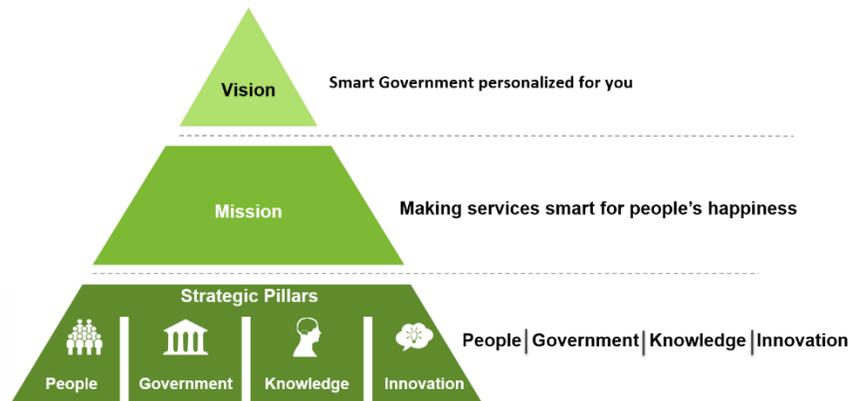
### Tomorrow's UAE Government (Leadership Vision)



- National Smart Government Plan that addresses **diverse needs**
- Transition to **smart devices** as the primary access channel
- Increased focus on Smart Services that are **predictive and pervasive**
- Advanced use of **Secure Identity** across Federal and Local Government entities
- Integrated infrastructure at a National level

**Figure 3: UAE Government, Today and Tomorrow**

With leadership direction in consideration, (FG) comes up with a clear national plan that consist of vision, mission and strategic pillars for smart government project as shows in Figure 4.



**Figure 4: UAE Vision, Mission and Strategic Pillars**

The vision statement “*Smart Government Personalized for You*” derives from five guiding principles that demonstrates the government initiative to have an intensive effort to approach every citizen with a personal touch:

1. **Considerate:** Provide services according to people’s preference in a way that makes them feel special.
2. **Attentive:** Actively listen to people with the aim of continuous improvement.
3. **Predictive:** Think ahead of what people will need and how to best meet their expectations.
4. **Responsive:** Respond and quickly adapt to trends and requirements as they arise.
5. **Trustworthy:** Strive to gain the confidence and trust of the people.

These principles assist in enhancing the mission statement of “*Making Services Smart for People’s Happiness*”. This declaration originates from the needs to have smart services that are driven by what makes people happy. So, the UAE government takes four values into account for providing smart services to achieve people’s happiness and satisfaction:

1. **Persuasive:** Serve people seamlessly wherever and whenever they demand.
2. **Integrated:** Deliver one-stop end-to-end services that meet peoples’ expectations.
3. **Proactive:** Take action ahead of time by anticipating needs and requirements.
4. **Adaptive:** Adjust and learn as services are provided and consumed.

Nevertheless, the four values guide government to recognize four foundational strategic pillars which have been selected as the main focus areas that reflect on both vision and mission correspondingly:

**1. People Centricity and Human Capital:**

- Consider the people perspective, experience in everything we do as a government and drive their participation inclusively.
- Focus on developing and advancing Emirati government cadres.

**2. Whole of Government:**

- Think of an integrated and connected government that functions as a whole.

**3. Information and Insights:**

- Build a rich information-based society with strong insights and derived knowledge.

**4. Innovation and Excellence:**

- Focus on innovation as the driver for excellence and creativity in delivering better services.

“We want further cooperation and integration to leverage our state and our institutions to the international standards which we aspire to prevail in the various fields and sectors, especially the government sector so that we can provide best services to our citizens and the public in general...” (UAE Government Summit, 2013)

By clarifying the above statements to all stakeholders of this project, (FG) with association of local government entities established different feasible studies to assess and observe the current gaps of e-government in order to align with the desired vision, mission and strategic pillars and priority areas. The result of a sample experimental study indicates that today’s UAE government services

require certain documents to be available in several places for delivery of a particular service. As shown in Table 1, approximately, 500 services across Dubai local and federal government sector require passports and IDs to resume a particular service. Suppose a client needs to register for a new baby born, parents' passport and ID are required in different federal and local government sectors such as; UAE identity authority, residency & foreigners' affairs, Ministry of Health. As a result, the client or customer usually struggles in going to all of these places and waiting in queues for several hours to complete the task of registering a new born baby.

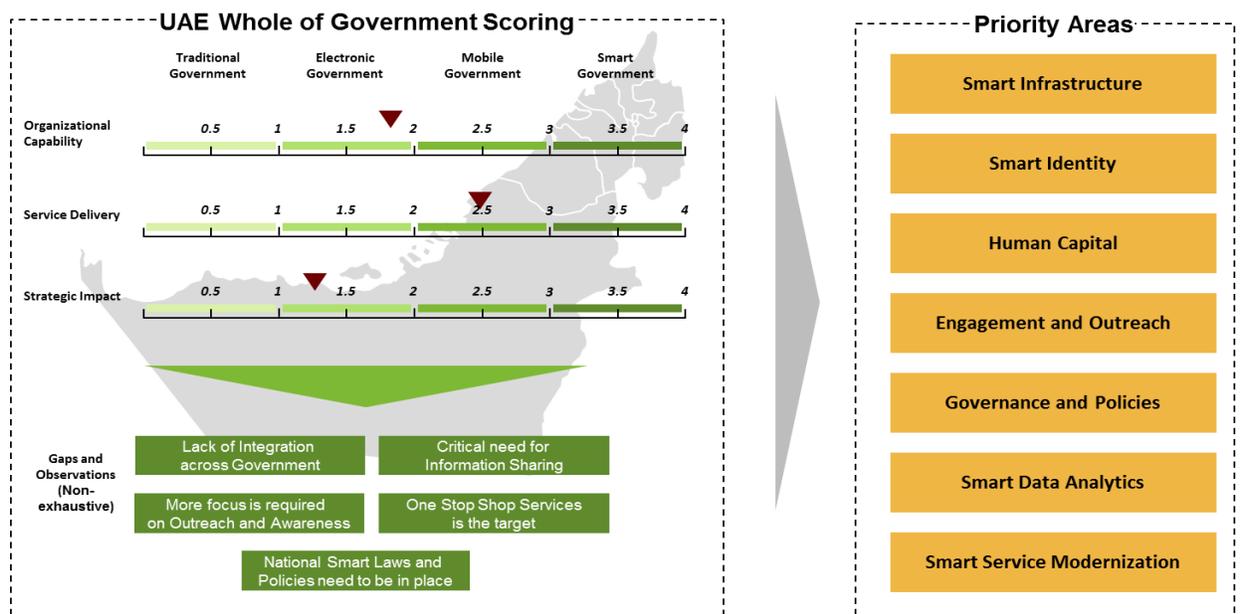
**Table 1:No. of Services require similar documents**

No.	Copy Documents Requested	No. of Services
<b>1</b>	<b>Passports and IDs</b>	<b>500</b>
2	Lease and Tenancy Contract	50
3	Business License	180
4	Site Plan	33
5	Vehicle Registration	45
6	Ownership Deed	72
7	Death Certificate	18
8	Building Permit	17
9	Labor Card	20
10	Certificate of Good Conduct	13

Consequently, this modest test demonstrates the lack of integration across government which leadership usually highlighted in different summit and conferences over the last decade. Hence,

another viable study conducted to detect the gaps for UAE government to approach smartness. As it is necessary to realize where the UAE government currently stands from being smart and to accelerate the trajectory towards the anticipated vision. Thus, Figure 5 elaborates UAE government position level scoring as follows: Traditional (0.0-1.0), Electronic-government (1.1 – 2.0), Mobile-government (2.1- 3.0) and Smart-government (3.1 – 3.99) which is based on three elements: 1. Organizational Capability, 2. Service Delivery and 3. Strategic Impact. It can be indicated that the current organizational capability (~ 1.80) and strategic impact (~1.30) are far behind from being smart across the UAE government. This means that the infrastructure of the UAE government require restructuring to increase entities' capability. For that reason, five gaps and observations generated from this empirical study which lead to establish a set of fundamental priority areas to accomplish the preferred targets respectively. Clarifying these gaps or challenges will support UAE government entities to transform to a unified harmonized manner of working that reduces time and effort and increases performance efficiency and customer's happiness. Each of the following gap describe one or two priority area that the government is apprehensive about:

<b><u>Gaps</u></b>	<b><u>Priority Area</u></b>
a. Lack of integration across government.	Smart Infrastructure
b. Critical need for information sharing.	Smart Identity/Smart Data Analytics
c. More focus required on Outreach and Awareness.	Human Engagement and Outreach
d. National Smart Laws and Policies need to be in place.	Governance and Policies
e. One-Stop Shop Services is the target.	Smart Service Modernization



**Figure 5: UAE whole of government gap analysis**

#### 4.1.1 Summary of Case (A) Issues and Interpretation

This case addressed UAE leadership vision which provides a strong inspiration for the government’s future direction. Based on this vision, FG identified a national vision, mission and roadmap for smart services application in the UAE. Throughout the conducted feasibility study, it can be noticed that the reputation of government is central in developing smart services projects in UAE. In Case A, the government is considered as part of the main strategic pillar and focus area in achieving the outcomes of smart services projects successfully. In this empirical study, UAE leadership and society are major stakeholders that government requires to consider their diverse needs and requirements. One of the minor observation conducted was sample experiment in Dubai where it showed statistically the number of the same documents required to be provided in different places for a particular service from customer that have negative impact on government reputation

such as, wasting time and efforts from both sides. This sample was evident in the gap analysis that (FG) conducted afterwards which investigated the government's performance and conducted a gap analysis. It is worth mentioning that the main results of these analysis are lack of integration across government and the critical need for information-sharing. These findings assist (FG) to identify and prioritize the fundamental areas to concentrate on them to enhance government performance that will match with stakeholders' desires and adapt smart services efficiently.

## **4.2 Case Study (B) Local Government Sector (LG)**

Understanding leadership requirements that are reflected on (FG) strategic planning for smart government initiative implies that all stakeholders play a vital role in accomplishing this enterprise. Therefore, this study observes one of the local government sector named (LG) who provide public and utilities services which has the strategic intent to be part of the UAE's smart ecosystem initiative. In-depth interviews were conducted with both managerial and operating level who are engaged in transforming manual to smart services to comply with smart government strategy. In addition, demonstrating and examining (LG) performance before and after implementation in this project is essential to measure this dissertation's core elements: quality of services, customer happiness and security and realize the benefit of this initiative before and after implementing.

- **LG Before Smart Services Implementation:**

LG is a public and utilities services entity that supplies water and electricity to customers from different categories. The difficulties that LG used to encounter are handling their stakeholders (consumers, suppliers, consultant, job seekers and other government entities) that visit LG to perform manual activities and services on a regular and daily basis. However, due to the massive and intensive, daily inflow of customers, LG had to open more branches to serve the growing number of customers. Even so, customers often have to wait for a long time in queues to apply for

a particular service or might visit LG branch several times before they are supplied with the required service. This leads to wasted time and effort from both sides. Separate of these problems, one possible advantage of the existing manual service is the low-risk of data breaches as the service is provided offline. This benefit is comparatively minor however when compared to the mentioned disadvantages and lack of technological progress of the government services remaining offline. That is why, the evolution of smart transformer initiative came into picture to provide cutting edge services to customer regardless of location 24/7 in 365 days. As emphasized by the UAE leadership, smart services are delivered via different approaches to increase the efficiency of services, in a reduced amount of time and with less effort. Inevitably, smart systems and technology can pose challenges such as raising the risk level of data breaches for governments hence, the overall commitment and priority is for governments to transform their services into smart interfaces to meet the expectations of people and improve their daily lives.

As LG is aware of these challenges, they build their strategic map using the third generation of the balanced scorecard to compile with FG strategy road map that present several alternatives respectively. This strategy map provides a clear visual indicator of how LG four strategic pillars interrelate to each other and form the overall strategy of the organization to overcome any obstacles that might prevent them from reaching their objectives. Understanding the following four perspectives gives the opportunity to highlight the main focus areas for LG to consider in developing smart services:

- Triple-Bottom-Line: this pillar concentrates on ensuring the sustainability in business decisions through taking into consideration financial, social and environment as

fundamental dimensions to manage organization performance in a broader business context.

- Stakeholder: this pillar focuses of expanding LG's value creation and innovation to cover all stakeholder categories.
- Internal Processes: this pillar concentrates on strategic prioritizing for different business processes leading to the satisfaction of all users.
- Support, Learning and Growth: this pillar concerns creating an environment that assists with LG change, innovation and growth to achieve excellence in LG operations.

Nevertheless, Smart transformation is considered one of the major aspects of LG's five-year developed strategic pillars and plan which aims to be part of enabling the smart city concept in the UAE through providing sustainable innovative world class customer service and utility by combining e-services and m-services to be smart services. To reflect this strategy map at the corporate level, LG place emphasis on ensuring the continuity of two-way communication processes that clearly bridge the gap between work knowledge and the strategic path for cascading and aligning LG's operational level towards the overall strategic direction.

- ***LG Smart Services after Implementation:***

According to the researcher, the implementation of smart services in their early stages encounter two main challenges that are worth mentioning. One of these challenges is building an effective team that require all representatives from all stakeholders (e.g. IT, Business and other third party organization/vendors) to meet the mentioned pillars. Another challenge is transforming the back-end processes to an enhancement process that minimize data entry, reduce the number of attachments and utilize fully the capability of mobile technology, such as location and services

camera. Inevitably, these challenges might affect some aspects of the smart services transformation, although it did not reflect negatively on the progress, acceleration and outcomes of the project. As stated in LG’s recent statistics, the perception of stakeholders’ adoption of smart app reached approximately 62% by 2014 since its launching in 2010, the app consist over 150 smart services were used at least 13 million times as follows:

**Table 2:** LG Adoption of smart services

<u>Year</u>	<u>No. of times used (million)</u>	<u>% increase between years</u>
2010	1.3	-
2011	1.8	37%
2012	2.4	32%
2013	3.1	29%
2014	3.7	19%

This indicates the consistent increase and successfulness in raising awareness and reaching out to stakeholders by continuous interaction with its smart services as well as ensuring the delivery of smart services through smart connected systems to provide living standards for citizens. Interviewees agreed that the desired outcomes of applying and adopting smart services will not succeed without a proper marketing campaign targeting the end users. Therefore, during project implementation LG attempted to raise the awareness about smart services via emails to customers, Push Notifications, Instagram, Twitter, ads on the internet and local news. Moreover, the initiation of “As’hal” smart kiosks that are installed in customer service offices aim to educate customers about LG’s smart services by providing all the instructions starting from uploading to service registration and its additional features. This leads to a reduction in the number of visits to offices, phone calls to call centers, it also speeds up the collection of bills, adding to that the services available 24/7 from any location. This has had a significant impact on the happiness index,

according to interviewees, LG's Happiness index exceeded 98% at beginning of 2015 in line with Happiness Index launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to gauge the happiness of people on a daily basis. LG achieved a score of 87% for community satisfaction where efforts are continuously applied to increase this score.

To continue to improve the quality of smart services provided through expanding and approaching all segments of society, a series of smart initiatives were launched during implementation of new smart services to comply with LG's strategy in serving all segments of society and raise the quality of services to global standards. One of the remarkable initiatives is "Ash'ir" service which supports speech and hearing impaired customers through conducting a live video chat service using sign languages that enable these customers to communicate directly with call center staff around the clock. Another LG smart approach is called "Estareeh", which aims to provide both comfort and happiness for its customer by improving services and providing them wherever customers are, so that they do not have to visit their branches.

In addition, this service provides customers with a variety of payment options to pay their bills electronically, in partnership with approximately 19 UAE banks. A further smart system development by LG aims to strengthen the relationship with its partners throughout establishing a portal that enables a direct communication channel and quick interaction with partners and stakeholders by making information easily accessible to them. This portal expands the scope of services which will help LG's strategic partners to utilize the benefits of these initiatives and to

integrate partners with each other to achieve common strategic objectives and obtain the highest levels of organizational efficiency and happiness.

Currently, the case study reveals several important aspects of security for smart services where there is a need to follow and improve security measures with the progress of the smart services project and minimize any potential data breaches. Two aspects are routinely addressed by the case organisation regarding security initiatives. The first level is to consider security in smart applications that provide services to registered users, while the other level is to rely on 128 bits encrypted communication channel in communicate to back-end system with staging firewall to ensure the highest standards and level of security. LG is currently concerned with the continuous enhancement to front-end channels to provide efficiency in services and make it more convenient to customers to access their services via different channels, for example, smart phones, wearable and smart appliances at home and in the car.

Expanding the available communication channels means raising the probability of possible risks of data breaches, as a result, LG invest more in providing the latest security measures to secure their latest developed communication channels. Moreover, LG foresees that to develop the smart city concept in the UAE, it is recommended that all government entities collaborate together in the concept of Shared/ Open or Big data, so that the government entities do not need to replicate the data in every organization. Unnecessary duplication of data causes it to become outdated and inefficient for use, rather instead to integrate the backend systems together so that the up-to-date information becomes available when/as required. For example, the passport and visa details, it would be more beneficial if the ERP systems across the governments collect the information

directly from DNRD rather than storing these data separately in every organization. Another example would include using the Emirates ID card as a single source of personal identification. In short, to achieve smart government that covers some aspects of smart city, it requires cooperation from all stakeholders within the organization, and with other government entities.

#### **4.2.1 Summary of Case (B) Issues and Interpretation:**

Case (B) presents the performance of LG; a local government entity that provide both public services and utilities before and after implementation of smart services. Where in this case, the research used three main measurement and evaluation criteria which are quality of services, customer happiness and security risk. The interviewees stated the issues encountered before smart services initiative that reflect FG's policy concerns in terms of providing the same documents for particular services manually which cost effort and time. Due to that manual approach, LG kept having intense inflows of customers to their branches. Despite, extending the number of branches to facilitate the massive and regular basis of stakeholders, this increase in service location remained a short-term solution, which gradually becomes overtaken by further increases in customers and service needs. Hence, LG built their roadmap to have more sustainable alternatives to comply with their current strategy that correspondingly is aligned with the overall strategic plan of FG. In addition, taking into consideration targeting all society segments.

It can be observed that the execution of smart services becomes successful through aligning project deliverables with stakeholders' different requirements based on developing and implementing several initiatives and encouraging more outreach awareness that target different segments of society (e.g. As'hal, Estareeh, Ash'ir – for disabilities etc.). This leads to what is exhibited in Table

2 for the increased adoption of smart services which raises client's happiness interactively. Finally, LG's case study research participants showed some measures to take into account regarding smart services security where they emphasized on investing more in this field. Lastly, they advocated assuring the collaboration amongst all stakeholders by having integrated open data accessible for all relevant government entities. This is recommended to ensure that all information are updated in all entities without unnecessary replication and duplication.

## **Chapter 5: Discussion**

### **5.1 Overview**

The purpose of examining two cases studies at different level of governance is to capture various aspects of developing smart services at different stages. This observation contributes in demonstrating these features in depth and evolve comprehensive answers to the dissertation's research questions and objectives.

Throughout the researcher's observation in Case Study (A) and (B) it was revealed that understanding stakeholders' requirements and expected outcomes from this project is considered a major priority for smart services success but at the same time is very challenging. Some studies infer that involving diverse stakeholders (e.g. Citizens, Government, and Leadership) in large-scale projects such as ICT project across government is considered a problematic collaboration .Having many entities engage in mega projects mean that different approaches may arise and it is likely it will be hard to accomplish all of them all, given the restricted time spans and constraints that usually face many projects. However, it has been argued that ignoring stakeholders' demands even at the design stage might cause missing some essential requests which can result in disappointing outcomes. Unfortunately, FG and LG cannot predict whether they accomplished all stakeholder's demands unless they complete and evaluate the projects fully.

Yet, addressing major gaps that UAE government currently encountered and classified them in priority areas support in complying with most stakeholder's requirements and build an appropriate, clear strategic planning and roadmap to address it for the benefit of the whole community. In other

words, FG focused on understanding and reflecting leadership vision and smart city aspects into reality, while LG focused more on citizens and third-party demands to reflect it in their operating activities. That is why, there are similarities of strategic pillars between FG and LG where both feature stakeholders as major strategic and success pillar in executing smart services in UAE. It can be also noticed that this case study research explores LG's key stakeholders through three assessment criteria which are: customer happiness, quality of services and security, where these elements assist to have better clarification of the interaction and involvement occurrence between LG and citizens that play vital role in successfulness of applying smart services efficiently. The findings indicate that LG continuously engage customers in the process and procedures of smart services provided through constantly conducting surveys regarding quality of services and customer satisfaction; receiving feedback will help them to stay on the right track and ensure delivery of the desired results.

Another critical challenge that impacts on the infrastructure of smart services projects is the lack and difficulty encountered in integration between local and federal government entities that then prevents the possibility of having open/big data for information sharing across the UAE government. Since each emirate in the UAE consists of local governance, regulations, policies and laws that can be different from other emirate, this federal political context creates complexity that must be negotiated and solutions implemented. That is why, in Case (A) the interviewees mentioned how customers struggle to replicate a single document at each visit to any entity to apply for a service (e.g. Identity Card, Passports etc.). While, in Case (B) they emphasize on collaboration of all government to achieve the concept of "Open/Big Data". Which this can be the reason of considering this challenge as one of the top priorities areas to overcome in Case (A). As

smart infrastructure is one of fundamental traits in accomplishing smart city concept like Smart Seoul Case that is pointed out in literature.

Other expected challenges and major risks that are likely to surface are securing the ICT infrastructure and data breaching. According to the literature, being smart means being advanced in mobility which lead to more possibility of disruptive actions, for example, Malware, Phishing and Fraud (RSA Conference, 2015). Any smart city ecosystem means more complexity, interconnected data communications and processing of greater volumes of information. Hence, this expansion in complexity of smart city technological and communication environment lead to more vulnerabilities to cyber-attacks. Thus, the UAE invests heavily in this field to align with the rapid information communication technology (ICT) race and provide the latest standards of cyber security in the UAE. One UAE initiative to secure data is establishing a federal entity specifically to identify a unified strategy, standards and assurance framework for both federal and local entities to ensure that all entities across the UAE is involved and follows the latest security standards to minimize the risk of data breaches. Despite, investing in this field to minimize risk, still risk managers will have to plan for data breaches that are possible to occur, however small the probability of the event.

It is interesting to identify some of the resemblances and differences of the mechanisms of applying smart initiatives that featured in Case study (B) in comparison with the Smart Seoul case study mentioned in the literature review. This benchmarking can address some ideas that can be applicable in the UAE. In both studies, they realize that smart services are meaningless tools without users, precisely “smart users”. They believe that the major primacy for increasing utilizing

smart services is through raising awareness and knowledge across users by expanding the domain of access to smart devices across all age groups. In Case (B), various methods are used to raise smart services awareness among customers and approach different segments of society. Raising knowledge through social media, emails and smart kiosks to educate customers of all instructions and steps required starting from installing software applications to registering for a service. Further, approach special needs segment via “Ash’ir” initiative that target speech and hearing impaired customers by conducting a live video chat service using sign languages that enable to communicate directly with call center staff round the clock. Another LG smart approach called “Estareeh”, where this service establish to provide both comfort and happiness for its customers by improving services and providing them wherever customers are, so that they do not have to visit their branches.

The results of these initiatives can be observed in the radical increase of smart adoption perception in last three years in Table 2. However, raising smart services awareness in Seoul is different, as the government needs first to ensure the extension of the access domain of smart devices through installing free Wi-Fi networks in different areas of the city and provide smart devices to most of Seoul’s citizens. Thus, the Seoul government is taking into account low-income families segments who do not obtain smart devices through the “Device Donation” initiative in order that all low-income families are able to purchase usable smart devices at low cost. Seoul approach different vulnerable groups which are impaired either financially or physically such as providing video call applications for the hearing-impaired, and likewise this is now implemented in the UAE.

Through witnessing Smart Services project experience in UAE, it can be indicated that each emirate ecosystem (e.g. people, business, operational, communication, water and energy) becomes complicated because of interconnected citizens, businesses, different modes of transport, communication networks, services and utilities. Hence, the notion of smart government services project is associated with the definition and characteristics of “Smart City” in terms of developing quality of life. Where most studies defined and emphasized that smart city concept is revolved around building, connecting and utilizing the ICT with urban life to achieve smartness (Harrison et al., 2010; Caragliu et al., 2009; Coe et al., 2001; Anttiroiko et al., 2013). Hence, UAE believes that the key to capturing all of the smart characteristics is through initiating “smart mobility”. Where building a solid ICT infrastructure can be considered as the first step towards sustainability in economic growth and quality of life that lead to a “Smart City”. This early innovation can be observed in both the UAE and as well in South Korea’s smart projects, where the UAE considers ICT infrastructure as a priority area in smart government services project which is also one of the main traits in smart Seoul.

## **5.2 Recommendations**

Based on the conducted empirical study and literature in this dissertation, the literature emphasized the essential role of involving stakeholders in developing large scale projects. A shortcoming of overlooking stakeholders is it may cause missing some of the essential requirements that might even lead to producing the wrong products. Therefore, to ensure the efficient utilization of this system is to consider the social informatics perspective who are the users of this project. In addition, the literature confirmed that there are a number of project failures reported due to unresolved tradeoffs among stakeholders (Cleland, 1985). This leads to the recommendation to

institute government as a primary stakeholder that represents other stakeholders' interests to ensure requirements delivery within legal and moral scope. That is why, it is worth noting that FG and LG attempted to highlight stakeholders' requirements and contributions throughout their strategic roadmap and key initiatives which lead one of local government entities (LG) to be successful in delivering the outcomes of this project which is reflected in the outcomes for the society happiness index. Presently, not all local government entities are at the same level of awareness about smart systems and need to follow the same aspects in terms of stakeholders' engagement on the importance in developing their performance results. This causes some entities to fail in providing smart services within the time permitted by the UAE Leadership.

From a technical perspective regarding smart services project implementation, FG strongly emphasized having smart devices as the primary access channel to smart services wherever it meets leadership concept in providing services 24/7 anytime and anywhere. However, to make smart devices as the main channel required investing more in developing security measures such as an advanced secure identity level across federal and local government entities to secure this channel. Also LG stressed and agreed with FG on the importance of effectiveness of collaboration between all federal and local entities in all emirates to apply the concept of open data; an integrated ICT infrastructure across all UAE governments is urgently required to meet stakeholders' diverse needs. This connectivity and unified system could not be achieved without establishing a unified set of national laws and policies applicable to all governments either federal or local.

A case study conducted outside of the Middle-East region would assist researchers and practitioners to find out more about some of the lessons learned. Also, there is a need to evaluate

what can be derived from the experience of other countries and cities such as the findings of the Smart Seoul case study which can be recommended for UAE smart infrastructure development. One of these recommendation is overcoming the limitations and centralization of telecommunication service providers through giving opportunities to other providers who can overcome some limitations that current companies in the UAE cannot solve like expanding the domain access of non-restricted Wi-Fi networks at different places in the UAE where allowing access for citizens anytime and anywhere supported through the highest and fluent data interchange rates. Another recommendation is providing a wider variety of communications sub-networks other than Wi-Fi, like CCTV enabling exchange through video data and U-Service network that link all of the websites of the public and offices under government. Other suggestion that can increase the number of smart users to facilitate the maximum benefits of smart services is to apply “Device Donation” that targets low-income families. This idea ensures that all major segments of society maintain smart devices.

## **Chapter 6: Conclusion**

This chapter concludes on the analysis and discussion of the main findings of the research, the research limitations and suggestions made for future research.

### **6.1 Conclusion**

Introducing in-depth the diverse aspects and traits of “Smart City” in the literature is essential to demonstrate the main challenges and opportunities of developing smart government services in UAE. This dissertation assessed this valued experience using qualitative approaches and case study methodology through exploring two main case studies. These two studies were selected to elaborate a comprehensive understanding and identify possible answers to the stated research questions and objectives. Case (A) investigated the strategic framework plan for smart services by assessing the current performance and gaps of UAE government and its approach to setting up all expectations for what leadership and government desired from this project. The findings of this research detected two main challenges in Case (A). The first challenge is the difficulty of understanding stakeholders’ requirements at the beginning of the project to ensure the fulfillment of these necessities during project activity. While the other challenge is the complexity of integrating the operations and services of Federal and Local government entities to overcome obstacles that prevent them from having shared Open/Big Data.

Whereas Case (B) concentrated on measuring three elements: 1. Quality of Services, 2. Customer Happiness and 3. Security. It can be indicated that Case (B) concerns delivering the highest standards and benefits of smart services to end-users (e.g. Citizens) and seeks to ensure increasing the number of users who used these services. Two main issues are addressed in Case (B) in addition

to the similar obstacles in Case (A). The first issue that this case encounters is building a collaborative team from different entities for large-scale ICT projects. This results in slowing down productivity and delivering smart services within the given timeline at other government entities. The second issue is that more mobility means a higher probability of risks of data breaches. Defining these challenges emphasize and highlight the importance of:

1. Engaging stakeholders in project management framework inclusively whenever it concerns the infrastructure of a city's ecosystem.
2. Building an alliance project management team that utilizes various skills to accelerate the project implementation to achieve outstanding results and objectives.
3. Benchmarking with other international cities to obtain further ideas to develop smart services in the UAE.
4. Initiating one of the main smart city traits of "Smart Mobility" to attain solid ICT infrastructure for sustainable growth.

## **6.2 Research Limitations**

This topic is important to be documented for future research purposes. The study's main limitation is the lack of accessibility to government resources. The data gathered in both case studies was extremely difficult due to interviewees' conservative attitude over giving away detailed information which was considered by them as valuable and politically sensitive. Also, due to the insufficient amount of research conducted on the smart topic in the Middle East region nor much of a publically available background of information on experiments in smart in the UAE, this lead the researcher to obtain information through attending recent live government conferences, summit, workshops and some reports provided by interviewees.

## **6.2 Suggestions for Future Research**

### **General Policy Makers**

The UAE leadership aims to be the smartest city by 2020, yet, rapid changes in technology cannot be underestimated. It is relevant to state that the performance of the overall organizations, government and society are not moving as fast as they should to comply with the radical changes to meet-up and overcome the various obstacles. As smart city infrastructure is based on enhancing ICT, some services fail in some government entities to keep up with change and various factors could be blamed for the inadequacies found on the e-government platforms and strategic performance, as investigated generally in gap analysis mentioned in Case (A) of this study. This could be an opportunity to examine other government entities and observe these obstacles in applying smart services in-depth to come up with more case comparisons that can contribute to this dissertation's findings.

### **Academic Researchers and Project Management Practitioners**

There are three major stakeholders which are central to the successful transformation of e-government to a smarter one under condition of compliance of their requirements: the citizens (public), the organizations (including both government and nongovernment) and the government at all levels (local and federal) (Olusesan et al., 2014). This research investigates two cases: one is regulatory federal where it explores the planning phase for one of the smart city traits function "smart services" functions dealing with both government and non-government entities. The other is local entity in a specific industry that implemented this function in its operating activities and deals with public. The findings and results are partially generalizable to other contexts. In other words, the cases in other entities can be different, for instance, a governmental stakeholder in our

case might be less regulated and involved than other entities. This could lead to a few possibilities for further academic research, where it is recommended to explore stakeholder management in other different industries to provide a variety of cases and experiments for better understanding how they manage stakeholders in ICT large projects as well as how government can reflect on citizen's needs (Pernille & Martina, 2013). Also, there is the possibility that each government entity has different approaches and priorities in executing smart services. That is why, this study emphasis on having further monitoring over planning and execution of this project from different aspects in different entities across the UAE. As the race of ICT keeps tremendously improving within short time frames, most research studies that address securing smart city (e.g. data breaches and cyber security etc.) can become quickly outdated. The traditional security approaches are not applicable and require evolution. Hence, it is suggested to have constant monitoring in this field for documenting and obtaining hard evident and resources for this valued experiment and race that comes across UAE. Finally, as the Smart City concept keeps continuously growing dynamically in reality, it is reasonable to assume that in near future this concept will reach a stable and normative acceptance, and then start slowly to fade away from priority and policy concerns.

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# Appendices

## Appendix A: Interview Structure

Date of Interview: ..... Location: .....

**Instruction:** This form to be used for recording the proceeding of interview. Notes should be extensive and accurately reflect the content of the discussion.

### Participants Detail (If applicable)

Name	Position	Remarks

### Key Area: Functions and Strategy

**Question 1/** describe your current and past job roles in organization?

.....

**Question 2/** would you describe the main functions of your organization.

.....

**Question 3/**What is your organization strategy for smart services project?

.....

### Key Area: Problems and Implementation Issues

**Question 4/**What are the key services problems that your organization faced before smart government?

.....

**Question 5/**What difficult is organization had to deal with in early stages of implementation of smart services?

.....

**Question 6/** What are the key issues of your organization is dealing now in August 2015?

.....

**Question 7/**What are the future plan for smart services over the next 3 years?

.....

**Key Area: Security**

**Question 8/**What are the main issues of security in smart government?

.....

**Key Area: Cost Benefits**

**Question 9/** What do you predict are the costs of benefits of smart services for your organization?

.....

**Key Area: Government or Organizations Collaboration**

**Question 10/** What contribution you require from other government organizations for smart services to be comprehensive for your customers? Please give an examples.

.....

**Key Area: Support Functions**

**Question 11/**What operational issues, training and marketing needs to be done to support smart services?

.....

**Question 12/** What else would like to say about e-government and smart government which we do not covered so far in this interview?

.....

**END OF THE INTERVIEW**