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Designing a Comprehensive Framework for e-Government Implementation Success with a Special View of the Case of Saudi Arabia

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Designing a Comprehensive Framework for e-Government Implementation Success with a Special View of the Case of Saudi Arabia

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business at Virginia Commonwealth University

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Dedication

This work is dedicated only to the one who started the journey with us as a family member.
To the one who was the spirit of the family.
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To the one whom I am not seeing his innocent face today, but I can feel his soul around me all the times.

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Table of Contents

List of Tables

List of Figures

Abstract

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As a result of the increasing development in the field of *Information Systems* (IS) in the last decades, new concepts have appeared to serve specific requirements and needs (Smith 2010; Almarabeh and AbuAli 2010). E-government is one of these concepts, which appeared in 1993 (Silva 2006) to become one of the main tools for governments around the world to enhance the services provided by governments and their agencies (Atallah 2001). Investigating the literature shows that there are common issues in all e-government implementation projects which can be summarized as follows: 1) e-government implementation projects in their nature are vast, and usually their success is critical for the country. 2) As the factors affecting the success of the implementation vary from different perspectives such technical, human, and political

perspectives, many overlaps and contradictions may appear while maintaining the success factors (West 2006). 3). Despite this verity in the perspectives, e-government implementation project in general should be treated as one unit, and success factors from all perspectives should be considered together in order to have a successful project (Cater et al. 2004). 4) The size of e-government projects and the complexity resulted from perspectives verity have created the need not only for identifying the success factors related to the process of e-government implementation, but also for creating frameworks for managing the implementation process (Chen et al. 2009).

In this research, a holistic framework for e-government implementation that considers the complexity of having several perspectives affecting the implementation process during its stages is proposed. We claim that this would solve the expected conflicts that may appear while considering different success factors from different perspectives, and it is supposed to be in compliance with the environment's situation. Approaching this problem would be an added value to the literature of e-government implementation and the literature of the IS field in general because the claimed holistic framework for e-government implementation is not addressed as an academic research. Also, targeting this problem is distinguished from the sort of problem that a government agency or its consultants would themselves be working on by being a generic framework that fits all countries' situations, and by considering all perspectives rather than focusing only on delivering the project requirements.

In order to achieve this, three artifacts are proposed in this research using *Design Science* discipline as guidelines for designing these artifacts which are: 1) designing a model represents the success factors for e-government implementation as extracted from the literature, 2) creating a framework for the success process of e-

government implementation, and 3) designing a physical instantiation for part of the project of e-government implementation in Saudi Arabia in order to evaluate the proposed framework. The findings of evaluating the proposed framework show tangible improvements in the implementation progress. Because e-government implementation projects are influenced by their environment, the results of this evaluation can be generalized only to other environments similar to Saudi Arabia, and determining the applicability of the proposed framework to other regions is left to future researches.

CHAPTER1: INTRODUCTION

1.1 Chapter Introduction

There is no doubt that the coming worldwide direction will be in information and communication (Boyle 2000). The unprecedented development in the field of information technology has moved the world from the industrial age into the information age (Almarabeh and AbuAli 2010), and the internet has made dramatic changes in the relations between businesses and people (Lenk 2002). Several organizations such as governments, commercial companies, and medical centers started to adopt information and communication technologies (ICT) to improve their performance and services (Chen 2006). Consequently, many new concepts in Information Systems (IS) have appeared in the world such as e-government and e-business to serve these needs (Smith 2010).

In fact, e-government has fast become one of the main tools for governments around the world to enhance the services provided by governments and their agencies (Atallah 2001). This has attracted academics and practitioners to investigate the process of e-government implementation and its success factors from different perspectives such as technical, social and political perspectives (Evans and Yen 2005; Co´rdoba-Pacho´n and Orr 2009). In spite of the huge quantity of these researches and the verity of their findings, reviewing the literature shows gaps, which need to be filled by more researches.

1.2 What is e-government?

Actually, the government in its origin is a dynamic mixture of goals, structures and functions (Pardo 2000). Thereby, the main goal of implementing e-government is to serve this concept and is not limited to creating a good website or processing transactions via the internet (Cater et al. 2004). E-government is a natural extension of the technological revolution that has accompanied the knowledge of the society, and can be used to add new concepts such as transparency, accountability, and citizen participation in the evaluation of government performance (Bertot et al. 2010; Mohammad et al. 2009).

The first use of the term "e-government" was in the late 1980s by some European countries. At that time, the term was used to introduce what were known as "Electronic Villages", which was about linking remote villages with the central government (Alasem 2009). However, the term "e-Government" as it is known today was first introduced in 1993 by the US National Performance Review (Silva 2006). The idea was proposed by former U.S. Vice President Al Gore within his vision of linking the citizen to the various agencies of government to get all kinds of government services in an automated way. The goal of implementing e-government projects was to automate the government working processes, in addition to reducing costs, improving performance, and expediting the speed of delivery (Almarabeh and AbuAli 2010). We can say that at that time, e-government was a process where government entities developed websites and populated these sites with information. After mastering the aspect of information dissemination, government units moved toward adding online transactions (Chen et al. 2006). Starting in 2000, the term became well-known, and began to be used in many developed countries around the world (Alasem 2009). By 2008, 192 developed and developing countries had launched their e-government projects and many others were in the process (UNPAN 2008).

Nowadays, e-government has become a permanent commitment made by government to improve the relationship among different parties such as citizens and commercial organizations, and to reduce the cost of operating government's processes efficiently (Chen et al. 2006). Therefore, e-government can be defined as the process of using information technology, especially telecommunications, to enable and improve the efficiency with which government services and information are provided to citizens, employees, businesses, and government agencies (Carter and Belanger 2004). In the last decade, e-government has become a reality and necessity, and many governments realized the importance of ICT to improve the delivery of information and services to citizens and business (Schwester 2009). Therefore, they have started to embrace the World Wide Web (WWW) for delivering their e-government services. For example, Forrester Research, which is a technology and market research company that provides pragmatic advice to global leaders in business and technology, predicts that more than $600 billion of government fees and taxes in the world will be processed through the web by 2006 (James 2000).

Based on that definition, the objective of e-government implementation can be summarized in general as follows: 1) increasing the efficiency of the services provided by the government, 2) decreasing the cost of providing government services, 3) adding new functions and capabilities to services, 4) organizing and utilizing the available data and 5) increase transparency and reduce corruption. Accordingly, e-government projects have been classified into four categories which are: 1) government-to-citizen (G2C), which allows citizens to retrieve information and complete government transactions, such as online license renewal; 2) government-to-employee (G2E), which takes advantage of internet technology to allow government agencies to interact with their employees online; 3) government-to-government (G2G), which supports online

communication and interaction among government agencies; and 4) government-to-business (G2B), which allows businesses to retrieve timely government information and complete transactions with government agencies, such as online bid submission (Hiller & Belanger 2001; Carter & Belanger 2004; Bertot et al. 2010).

In the history of e-government, the implementation process has gone through various stages. According to Howard (2001) and Lau (2001), there were four major stages of e-government development: 1) Information publishing; this stage is very basic where government is only able to post information on the official government websites. The presented information may include information about available services, contract, and government events. 2) Two-way communication; in this stage citizens have the capability to communicate with the government through official website(s), and make simple requests. These requests are still not processed online; the government employees receive these requests and process them manually. 3) Transaction; this stage is more sophisticated than the previous stages, allowing citizens to conduct transactions online, such as renewing driver's licenses. 4) Integration; this is the most sophisticated stage of e-government development. In this stage, all government services provided from different departments and agencies are integrated and accessible through a single website, an e-government portal.

Chen et al. (2006) state that e-government implementation is different from any other traditional IT implementation, the main difference being that in traditional IT projects, information flows in a vertical direction within the same area, while in e-government, information flows in vertical and horizontal directions among different departments. In addition, Ravichandran and Arun (2000) stated that the implementation of e-government is a complicated project, and it must be divided into a

number of constituents and stages in order to simplify and organize the project. These constituents and stages are related to each other and controlled by different factors such as motivations, global and internal changes, and other constraints, which make the environment of e-government very unique and complex. According to Belanger and Hiller, the implementation of e-government can be categorized as follows: 1) Government with individuals for delivering services. 2) Government with individuals for political process. 3) Government with business as a citizen. 4) Government with business in the marketplace. 5) Government with employees. 6) Government with governments. Comparing this classification to the well-known classification mentioned at the beginning of this section, which classifies e-government implementation projects to four sections: G2C, G2E, G2G, and G2B, we can say that they are compatible with some additional information. Ravichandran and Arun classification tells that G2C has two main directions which are about delivering services to customers and applying government political processes on customers. Also, the classification tells G2B has two main directions which are related to citizens and marketplace.

1.3 The importance of e-government

The main gain from implementing new technology in a government environment is not doing high-technology things, but doing the everyday things of government in more efficient and less costly ways (Kelly 2003). Therefore, the basic idea behind implementing e-government is to allow citizens to interact with their government through the internet because of its efficiency and availability for everyone; for example, citizens can ask questions and receive answers, explore government regulations, get updated on them, obtain government official documents,

fill applications, pay taxes and bills, receive payments, and so forth (Alpar and Olbrich 2005).

Boyle (2000) points out that there are three primary reasons why e-government is important. 1) It encourages the adoption of digital technologies that are crucial to economic competitiveness, 2) it allows government to redefine its role and become more citizen-focused, and 3) it can reduce the cost while not compromising the quality of public services.

Seng et al. (2010) stated that governments which recognize the importance of information technology (IT) to enhance government services efficiency are increasing dramatically. For example, in the mid to late 1990s, the development of e-government programs was an optional luxuriant feature for governments to enhance provided services or provide new services through new technologies. A study by West (2006) indicates that e-government implementation progress through the publishing of web information in the U.S. is varied based on the adoption of the state governments of web based technologies, while it is now considered as a requirement for any modern government (Seng et al. 2010).

Currently, the successful implementation of e-government has become one of the most known and widespread goals when it comes to the modernization of public administrations (Lenk 2002; Aichholzer & Strauss 2010). Also, many governments around the world have launched their e-government projects in order to provide their citizens and organizations with more convenient ways to access government information and services (Turban et al. 2002; Kuzma 2010). For instance, the yearly spending on IT in the United States was around $50 billion in 2002 and 2003, and the

size of e-government in the US exceeded 35 million online web pages over 22,000 website (Chen 2006).

1.4 Research Problem

Because of the importance of e-government implementations, it has attracted numerous research interests from universities and industries (Carter & Belanger 2005; Huang et al. 2004). Many of these researchers have tried to identify the success factors and issues that may face the implementers of any e-government project (West 2006). Looking at these researches shows that the subject of obtaining the success factors in e-government implementation is vast, and it can be affected by different conditions. Also, these researches show that these success factors differ according to the situation of the country itself (Chen et al. 2006). Seng et al. (2010) state that "the implementation and use of IT in organizations can no longer be viewed as a linear process by which the organization adapts to technological change or that the technology determines the organizational use of IT, instead it involves a complex understanding of the interaction arising between social and technological forces".

In addition to the variety of the success factors affecting the process of e-government implementation, the literature shows that the topic entails to be studied and treated from different perspectives. For example, some studies have discussed success factors from a software development perspective, and treated e-government projects as any software development projects (Karahanna et al. 1999; Moon and Kim 2001). Other researchers dealt with the hardware, and infrastructure angle of the project, and discussed the success factors from that perspective (Abanumy et al. 2005). Also, some researchers dealt with e-government as systems integration, i.e. enterprise resource management (ERP), and investigated the success factors of the

implementation accordingly (Schwester 2009). In addition, other researchers viewed the subject as a public service, and extracted the success factors of applying these services (Carter and Belanger 2004). These success factors differ from country to country based on several conditions such as the budget assigned for the project, the readiness of the existing processes to be converted to online processes, the readiness of the users to deal with the internet instead of traditional interactions, etc. (Aichholzer 2004; Alpar and Olbrich 2005). In conclusion, in order to have a successful e-government implementation, all success factors and implementation issues should be considered from all related perspectives.

Moreover, the literature shows that the process of e-government implementation may be affected by environmental factors. For example, the environment of implementing e-government in developed countries is very different from the environment in the developing countries. For example, 75% of Australians submit their taxes through the internet, while only 3.4% of the population in Bangladesh even has a traditional telephone (Chen et al. 2006). Therefore, the success factors for implementing e-government in these two countries are expected to be different too. In 2002, 49 countries in the world were designated to be the least developed countries, and this classification was based on the following criteria: 1) the value of their human assets, 2) the degree of their economic vulnerability, 3) the knowledge and skills in the countries, and 4) GDP per capita which is an indicator for the total market value of the goods and services produced by a country during a specific period (UNCTAD 2002). According to the Annual Global Accenture study in 2002, the five leader countries in e-government implementation are: Canada, Singapore, the United States, Australia, and Denmark.

In fact, most, if not all, research that is targeting success factors of e-government implementation in the literature is directed at developed countries, while there is a huge demand in developing countries to implement e-government projects (Huang et al. 2002). For example, 500 e-government programs were launched in the year 2001 by different governments worldwide (Palmer 2002). Chen et al. (2006) have proposed criteria for distinguishing between developed and developing countries. These criteria are based on five factors inherited from different studies, which are: 1) history and culture, 2) technical staff, 3) infrastructure, 4) citizens, and 5) government officers. The differences in these factors between developed and developing countries, which are provided by them, are summarized in the first two columns in table 1.1. Also, Chen et al. (2006) proposed a strategy for developing countries, and they built their proposed strategy based on a case study of e-government implementation in China. They mentioned in their study that due to substantial differences in many key aspects of e-government related to technological and social conditions between developed and developing countries, there is a need for creating new strategies for implementing e-government in developing countries. These strategies are supposed to consider the differences between developing and developed countries in the five factors proposed by Chen et al. (2006).

In my opinion, differentiating developing countries from developed countries in e-government implementation is an efficient step to improve e-government implementation in developing countries as has been shown by Chen et al. (2006). However, treating all developing countries in the same way, and likewise treating all developed countries in the same way, is not practical. For instance, what is proposed for China may not be applicable for Saudi Arabia. This is because the situation and circumstances in these two countries are totally different, although both of them are

considered developing countries. Therefore, a strategy for e-government implementation for any country based only on the given country being either developed or developing is not realistic. There is a need for having more advanced criteria that will consider all possible success factors for e-government and will match them with the different aspects and circumstances in the given country.

Although many studies indicate that a large proportion of initiatives to implement E-government around the world did not succeed in achieving the promised goals, there is, in fact, a global consensus on the existence of the need for deeper studies to understand the real reasons behind this failure, and generate a framework that guides governments and their agencies to have a successful e-government implementation. In spite of higher percentage e-government projects that failed to achieve its goals globally, the world is witnessing a comprehensive consensus that there is still the possibility of e-government initiatives to fulfill all their promises, but the underlying potential of these initiatives will only be achieved through access to a better understanding of the obstacles faced by each country and therefore to work out ways to overcome these obstacles (Heeks 2003; Almarabeh and AbuAli 2010; Bretschneider 2003; Mutula and Mostert 2010). As it is shown in the following chapter, there is no unified framework that consolidates all of these factors that affect the success of e-government implementation with consideration of all possible perspectives. In addition to that there is no comprehensive study in the literature that explains in a process format the steps needed to have a successful e-government implementation that could be used for all countries in spite of the importance of the topic.

The issues in e-government implementation can be summarized as follows: 1) e-government implementation projects in their nature are vast, and usually their success is critical for the country. 2) As the factors affecting the success of the implementation are varied from different perspectives such technical, human, and political perspectives, many overlaps and contradictions may appear while maintaining the success factors (West 2006). 3) Despite this verity in the perspectives, e-government implementation project in general should be treated as one unit, and success factors from all perspectives should be considered together in order to have a successful project (Cater et al. 2004). 4) The size of e-government projects and the complexity resulted from perspectives verity have created the need not only for identifying the success factors related to the process of e-government implementation, but also for creating frameworks for managing the implementation process (Chen et al. 2009). Accordingly, there is a need in the field of e-government implementation for having a holistic view at the process of e-government implementation with consideration of all perspectives in order to maintain the numerous factors affecting the success of the implementation and determining the required sequence.

Accordingly, the research problem can be defined as finding a holistic framework for e-government implementation that considers the complexity of having several perspectives affecting the implementation process during its stages. In addition, this framework should solve the expected conflicts that may appear while considering different success factors from different perspectives, and it is supposed to be in compliance with the environment's situation. Approaching this problem would be an added value to the literature of e-government implementation and the literature of the IS field in general because the claimed holistic framework for e-government implementation is not addressed as an academic research. Also, targeting this problem

is distinguished from the sort of problem that a government agency or its consultants would themselves be working on by being a generic framework that fits all countries' situations, and by considering all perspectives rather than focusing only on delivering the project requirements.

1.5 Suggested solution

In the field of IS, there are two complementary paradigms that are acknowledged for conducting IS researches which are behavioral-science paradigm and design science paradigm (Hevner et al. 2004; March and Storey, 2008; Sein et al. 2011). Behavioral science is initiated as a natural science method in order to develop and justify theories that explain or predict the relevancies of a phenomenon. In the field of IS, the phenomenon can be any organizational or human phenomenon surrounds the analysis, design, implementation, management, and use of information systems (Hevner et al. 2004). On the other hand, Design science is initiated by engineering and artificial science as a problem solving paradigm in order to create artifacts define ideas, practices, technical capabilities, and products (Simon 1996; Denning 1997). Henvner et al. (2004) state that design science in the IS field is used to "create and evaluate IT artifacts intended to solve identified organizational problems". Since that the literature of e-government has provided several theories pertaining to the implementation of issues from several perspectives, this study will take the respective of design research to produce ARE artifacts in order to identify the problems in e-government implementation, propose a solution for these problems, and evaluate the proposed solution. Artifacts in IS field should be used to enable IT researchers and practitioners to understand, address, or solve issues related to the field

of IS (March and Smith 1995). According to Henvner et al. (2004), "IT artifacts are broadly defined as constructs (vocabulary and symbols), models (abstractions and representations), methods (algorithms and practices), and instantiations (implemented and prototype systems)".

In this research, the literature of e-government is deeply investigated in order to extract all previously published success factors for implementing e-government from different perspectives. Next, all of these factors are combined into a single model in order to obtain a generic and holistic picture of this research topic area, and the proposed model will be evaluated. However, identifying and modeling these factors is not sufficient in such a wide and changing environment; rather, identifying and designing a success-process for implementing e-government is needed. Therefore, as no single success-process for implementing e-government will likely fit all government environments, as has been shown by many published studies, a comprehensive framework for designing a success-process for government implementation is developed, based on the generic model constructed from the literature, using a design science approach. Finally, the proposed artifact is evaluated using a case study approach looking at the success-process for the project of implementing e-government in Saudi Arabia, and this required designing a physical instantiation for part of the project. Table 1.2 summarizes the dissertation's deliverables.

1.6 Saudi Arabia and e-government

Saudi Arabia is a developing country located in southwest Asia in the heart of what is generally referred to as the Middle East. The idea of implementing e-government in Saudi Arabia started in 2000, and an official committee was established

to conduct and manage the implementation of the project in 2004. The members of this committee are a combination of employees from different ministries and commissions in Saudi Arabia, such as the Ministry of Finance, the Ministry of Communications, and the Commission for Technology. The main task of this committee is to outsource the implementation of the e-government project, and represent the Saudi government during all stages. However, after more than six years, the only output from the whole project is a single website that has the capability of executing around twenty processes related to health, insurance, and social life.

The project of e-government implementation in Saudi Arabia is chosen to be the case study for evaluating the artifacts of this dissertation because of the lack in delivering on the project and the latency of the progress provide a very suitable environment for examining the proposed solution process. This will give the researcher a golden opportunity to examine his proposed process. In addition, although Saudi Arabia is considered a developing country, it has special characteristics, which distinguishes it from other developing countries (Abanumy 2005). The first one is that the population in developing countries is usually very large (Chen et al. 2006), while it is small in this country. For example, in 2005, the population density in Bangladesh was 1126 people per square kilometer, while it was less than 12 in Saudi Arabia in the same year (United Nations World Population Prospects 2005). The second difference is that because of the economic status of Saudi Arabia, the annual income for the government as well as for individuals is very high, compared to other developing countries (Abanumy 2005). For instance, gross domestic product (GDP) per capita in China in 2009 was $3,744 while it was $14,745 in Saudi Arabia. Consequently, construction levels and infrastructure in Saudi Arabia are equivalent to those in developed countries (World Economic Outlook Database-October 2010). On the other

hand, Saudi Arabia lacks knowledge and experience to handle high technology projects because it is not an industrial country, and the need for using technology and education started after the discovery of oil in the 1970s. Also, the manpower in Saudi Arabia is not sufficiently qualified to handle these projects as a result of the luxurious life style of its residents, and the small population size (Abanumy 2005). These differences are reflected in the five factors provided by Chen et al. (2006) to distinguish between developed and developing countries. The third column in table 1.1 shows that Saudi Arabia does not fit well in either of the two categories. In other words, Saudi Arabia can be considered a developed country with respect to some factors, and a developing country for the others. This assures the need for having more sophisticated criteria for selecting a successful strategy to implement e-government, other than simply dividing countries into developing and developed countries, and design the process for implementation accordingly.

Factor	Developed countries	Developing countries	Saudi Arabia
History and culture	• Government and economy developed early • Constant growing economy • Long history of democracy	• Government and economy developed recently • Inconstant growing economy • Short history of democracy	• Government and economy developed recently • Inconstant growing economy • Short history of democracy
Technical staff	• Having the required staff • Having resourcing capability	• Missing the required staff • Missing resourcing capability	• Missing the required staff • Missing resourcing capability
Infrastructure	• Good infrastructure • Internet access to all	• Bad infrastructure • No Internet access to all	• Good infrastructure Internet access to all

Citizens	• Having access to internet • Experience in using systems	• Minimum access to internet • Poor experience in using systems	• Having access to internet • Poor experience in using systems
Government officers	• Having computer literacy	• No computer literacy	• No computer literacy

Table 1.1: Distinguishing between developed and developing countries (Chen et al. 2006)

S	Deliverables
1	Designing a model represents the success factors for e-government implementation as extracted from the literature.
2	Designing a framework for the success process of e-government implementation.
3	Designing a physical instantiation for part of the project of e-government implementation in Saudi Arabia.

Table 1.2: Dissertation's deliverables.

CHAPTER 2: LITERATURE REVIEW

2.1 Chapter Introduction

Reviewing the literature of e-government shows that there are numerous obstacles and success factors related to e-government implementation projects, and several perspectives are involved together in the implementation process (Chen et al. 2009). Due to the fact that maintaining categorized list of factors that may influence the success of the process of e-government implementation would be more feasible than maintaining a long list, these success factors need to be classified into different categories based on clear criteria. In this study, the success factors related to e-government implementation are classified into three categories where this classification is resulted from investigating the literature and tracing different sources that produced these factors to the literature

- The first source of the success factors is derived from the fact that e-government implementation projects in their origin have started as *software applications* (SW). Then, these SW applications needed to be integrated into one systems integration e.g. ERP system, and now, in the third stage, as public service solutions which deal with the public and provide services for them. Therefore, all success factors related to these three stages should be considered in an e-government project (Sykes et al. 2009; Brusa et al. 2008; Chen et al. 2009). Because the success factors extracted from this category are related to the evolution of e-government, the category is named as "*Evolutional points of views*". Thereby, the term evolutional success factors in this research is used to refer to all success factors related to e-government implementation which is inherited from the history of e-government

and its evolution from being a simple application, integrated systems, and as a public service that serves everyone.

- The second source of the success factors occurred from the fact that e-government implementation projects have different beneficiaries such as individual residents, organizations, governments, and government employees, and they have different interests which may contradict with each other in many cases. Therefore, it is important to focus on each beneficiary and extract the related success factors from the literature in order to be able to solve the contradiction (Alasem 2009; Quam 2004; Barham 2002). Because the success factors extracted from this category are related to the beneficiaries of e-government, the category is named as "*Beneficiaries points of views*". Thereby, the term beneficiaries' success factors in this research is used to refer to all success factors related to e-government implementation that emerged from the requirements of e-government beneficiaries.

- The third source of the success factors is derived from the fact that e-government implementation projects differ depending on the situation of the country where the project will be implemented. For example, the readiness of the infrastructure of the country has tangible impact on the success of the implementation. Therefore, it is important to focus on extracting the success factors related to the situation of the environment (Heeks 2003; Chen at al. 2009). Because the success factors extracted from this category are related to the environment of the country, the category is named as "*Environmental points of views*". Thereby, the term environmental success factors in this research is used to refer to all success factors related to e-government implementation that emerged from the country and other surrounding situation.

The importance of e-government and its various forms have encouraged researchers from different fields such as technical, social, and political fields to propose frameworks and models for implementing e-government projects. As it is described in section 2.4, these artifacts are not comprehensive, and they are created to treat the topic only from their perspective. Consequently, many contradictions have appeared between proposed artifacts, and it has made it difficult for the implementer to comply with all perspectives at the same time.

In this chapter, the researcher has digged deeply into the literature of e-government implementation in order to extract and gather all success factors related to the aforementioned points of view, in addition to exploring the proposed processes for e-government implementations which are proposed from different perspectives to cover parts of the whole implementation process. At the end of the chapter, a more complete picture is gained, and all points of view are aggregated together, as well as the related issues and success factors. This also helps in identifying the gaps in the whole topic area from a research perspective.

2.2 Evolutional point of view

There is no doubt about the need for reengineering business processes in any projects at the enterprise level (Sarkar & Singh J. 2006; Sykes et al. 2009). In e-government projects, business process reengineering or redesign (BPR) usually preferred to be conducted before starting on implementing the e-government project itself because government has to review and enhance their old processes as some processes need to be aligned to fit the new electronic style (Drew 2007). Aydinli et al. (2009) have discussed this need and proposed a new BPR implementation approach

that was developed at Utrecht University. The implementation approach is based on a combination of *enterprise information architecture* (EIA), *business process modeling* (BPM), *knowledge management* (KM) and *management control* (MC) methodologies and techniques. It starts by describing all relations and information exchanges with all stakeholders, and compares them to more traditional approaches, which tend to have a main focus on the internal processes. Then, the approach suggests aligning the processes and systems across different participants, such as suppliers and customers, in the supply chain. Also, the implementation approach included management control design mechanisms to ensure that the organization's strategy is in sync with its processes and activities that are performed by the employees.

Another factor inherited from systems integration is the issue of semantic heterogeneity and its aspects. The literature shows that not considering this factor in early stage of e-government implementation may lead to many drawbacks which are difficult to recover. According to Abecker et al. (2004), the e-government area is the most promising field for ontologies, and this is due to the type of information and knowledge required by the field and shared by many stakeholders. Although several methodologies for developing ontologies have been defined in the literature (Wache et al. 2001; Corcho et al. 2003), two groups of methodologies can be singled out: 1) the one proposed by Gruninger and Fox (1995) which can be considered as experience-based methodology; and 2) the ones that proposed by Gomez Perez et al. (2004) and Noy & McGuinness (2001) which can be considered as life cycle-based methodologies. Brusa et al. (2008) propose a process for building domain ontology in e-government that combines the two groups, and is based on the IEEE standard for software development. According to these authors, the goal of this ontology

development process is to build domain ontology as a formal structure expressed in a formally defined language.

Security and privacy are frequently cited in academic and practitioner literature of e-government as major factors that affect and determine the success of e-government projects implementation (Daniels 2002; James 2000; Joshi et al. 2001; Lambrinoudakis et al. 2003; Layne and Lee 2001; Sanchez et al. 2003; Bonham et al. 2001; Gefen et al. 2002). According to Ebrahim and Irani (2005), there are two aspects for this factor: 1) the technical aspect, which includes threats from hackers and intruders, threats from viruses, high cost of security applications and solutions, and assurance that a transaction is legally valid, and 2) the organizational aspect, which includes lack of knowledge for security risks and consequences as well as lack of security rules, policies and privacy laws.

Moreover, some researchers relate the factor of citizens' acceptance in e-government projects, which is discussed later in the second dimension, to the success in maintaining information privacy (Bednarz 2002; Friel 2002; Thibodeau 2000). Belanger and Hiller (2006) state that the privacy issue exists in any e-government implementation project, and it differs significantly according to the selected direction of the project, the external conditions, and the constraints. Thus, they proposed a framework to deal with this complexity by dividing the implementation process into four stages, which are: 1) information, 2) communication, 3) transaction, and 4) integration. Also, they divide the issue of privacy into four factors: 1) policy, 2) rules and regulations, 3) technical feasibility, and 4) user feasibility.

Moreover, knowledge management is an important factor that should be considered in e-government implementations. According to the findings of the

evaluation conducted by Goh et al. (2008), the average e-government portals are featuring only about 36 percent of knowledge management mechanisms that should be considered. Knowledge management, in general, has attracted the attention of organizations and governments which aim to enhance their efficiency, performance and competitiveness. It aims to make organizations realize the value of their knowledge as assets and to exploit it (Wiig 1997). To achieve this aim, knowledge must be created, maintained, transformed, disseminated, and shared carefully within the organization (Smith 2001). In an e-government environment, the amount of information is vast, and there is an increasing need to promote more efficient processes. Therefore, many governments have launched knowledge management projects within their e-government projects to meet the needs with high standards of quality, courtesy and responsiveness (Goh et al. 2008). Therefore, knowledge management should be considered in e-government projects, and projects that were initiated without considering it usually have a lack of social impact and interpersonal interaction (Nah et al. 2005).

Edmiston (2003) concluded that the main issues in e-government implementation projects can be summarized into three groups: 1) Marketing e-government to government employees, citizens, government agents, and other organizations. 2) Privacy issue which results in not trusting e-government applications and services. 3) Financing e-government projects, which may prohibit feasible improvement in the services provided by e-government.

Technical researches have listed many software development issues that are related to e-government implementation success. These issues can be considered as success factors for e-government implementation if we look at it as a pure technical

project. These issues can be summarized as follow: 1) IT skills and lack of IT training programs in government (Bonham et al. 2001). 2) Shortage of well-trained IT staff in the market (Heeks 2002). 3) Lack of employees with integration skills (Ho 2002). 4) Website development by unskilled staff (Layne and Lee 2001). 5) Unqualified project manager (NECCC 2000). 6) Shortage of salaries and benefits in the public sector. 7) Flow of IT specialist staff. 8) Organizational lack of coordination and cooperation between departments (Burn and Robins 2003). 9) Lack of effective leadership support and commitment amongst senior public officials (Heeks 2002). 10) Unclear vision and management strategy. 11) Complexity of business processes, politics, and political impact (Lenk and Traunmuller 2000).

2.3 Beneficiaries point of view

As it has been mentioned in Chapter 1, the beneficiaries of e-government can be divided into three categories: 1) individuals' category, which includes citizens and government employees, 2) organization category, which includes the government, its agencies, and other organizations, and 3) the society category.

From an organizational point of view, the right information architecture is one of the major success factors in implementing e-government projects. This factor can be described as managing and organizing government information to provide public information and services to citizens without needing to know which government agency is the source (Alasem 2009). Although this factor is related to the organizational level, it may be reflected on the individual level in one of the following ways: individuals may 1) refuse using the system, 2) carry out their task elsewhere, 3)

try to minimize using the system, or 4) require more time and support to accomplish tasks (Maurer 2004).

Consequently, "many governments, particularly in developed countries have become aware that information architecture is essential in terms of government resources and services discovering, accessing and managing on the World Wide Web, thus a number of international and national metadata standards have evolved for describing government information and services and to be used across the public information systems sectors in those countries to achieve the aim of establishing e-government projects" (Alasem 2009). Metadata can be used as a tool in e-government applications to improve multiple functions such as making government information organized, easy to find, and manage, as well as interoperable. This has been shown by Tambouris et al. (2007) in their comprehensive study where they described the scope of metadata in e-government projects as fundamental to these projects. In addition, Quam (2004) asserted the importance of metadata in government portal websites, and considered metadata as the main function in e-government projects that give access to a wide range of government information and services through one access point. Moreover, Quam attributes problems in many government websites to developers of these websites not attaching sufficient importance to metadata. Cumming (2001) and Morville & Rosenfeld (2006) point out that problems often relate to poor information architecture, and they suggest using metadata in order to avoid having messy and complex data that make the information useless.

In practice, metadata has been used in many countries in e-government implementations; for example, Andersen (1999) summarized the development of Denmark national metadata standard processes, and Barham (2002) shows the

importance of using metadata in the implementation of New Zealand e-government. Also, Rothenberg et al. (2005) report on designing national standards for Metadata to improve access to digital information in the Dutch government. The report examined and evaluated a range of national and international metadata standards in order to develop the Netherlands nationwide metadata standard. The term *metadata* is a new term in information system, and is inherited from management science. Actually, it is used by librarians to describe a library's resources such as title, author, publisher, etc. (Haynes 2004). Currently, metadata has become a part of many online activities, such as e-business and e-learning, in addition to e-government, and the benefits of using metadata in the e-government domain can be seen in several aspects such as: 1) facilitate the discovery of e-government resources, by identifying resources, bringing similar resources together, distinguishing similar resources, and giving location information and 2) use as a tool for the management of information resources (Carter and Belanger 2004).

Another factor that needs to be considered in e-government implementation, as mentioned by Alsaghier et al. (2005), is citizen acceptance. In fact, this can be considered as an individual factor more than a technical or organizational factor. It can be defined as the resistance of users to accept or deal with a government interface for reasons that are not related to technology. Alsaghier et al. (2005) state that this issue is originally associated with the relationship between user and owner, and in the e-government case, the relationship between citizens and government. Also, they concluded in their study that trusts between citizens and government agencies and systems plays a vital role in the success of any e-government implementation.

Trust has been cited as an important and crucial requirement for economic and social interactions (Baier 1986; Barber 1983; Dasgupta 1998; Lewis & Weigert 1985; Luhmann 1979; Mayer et al. 1995; McAllister 1995; Rotter 1971). Trust has also been observed as a key value in e-commerce (Gefen, 2000; Gefen & Straub 2004), and in e-government (Galindo 2002). It can be defined as an individual's (trustor here the citizen) belief or expectation that another party (trustee, here e-government) will perform a particular action important to trustor in the absence of trustor's control over trustee's performance (Mayer et al. 1995). The literature shows trust between citizens and government is influenced by the following factors: 1) *Disposition to trust*, which can be defined as a propensity or tendency to believe in the positive attributes of others in general (McKnight et al. 2004). 2) *Familiarity*, which is a stage where people use their previous experience (Luhmann, 1988), interactions, and learning to understand what, where, why, and when people do what they do (Gefen 2000). 3) *Institution-based trust*, which is the trustor's confidence that the situation structures to facilitate outcome success of trusting behavior exist (Pavlou et al. 2003), and more impotently, that sanctions will be imposed when trust is breached (Humphery & Schmitz 1998; Lane & Bachmann 1996). 4) *Perceived usefulness*, which is the degree to which the user believes that using the system would enhance his or her task performance. 5) *Perceived ease of use*, which is the degree to which the user believes that using the system is easy and free of hard effort (Gefen, Karahanna, & Straub 2003).

There is also another acceptance factor mentioned by Andersen (2006), which is the readiness and willingness of citizens to accept and adopt new technologies. According to Andersen, citizens' desires and needs should be considered in order to encourage them to use the new systems.

Arif (2008) elucidated the necessity of customer orientation in e-government projects, and argued that ignoring the importance of customer orientation may affect the success of the whole project. Arif concluded that customers of government projects should be allowed to participate in three stages: 1) collecting information, 2) disseminating information, and 3) maintaining information. According to Arif, e-government customers can be government employees, citizens, and organizations.

Apart from the technical success factors in e-government implementation, Mutula and Mostert (2010) have studied the need for considering the social needs for the customers since the beginning of the implementation of e-government in parallel with other technical needs. They state that the current e-government applications focus on automating the government's processes more than focusing on the societal needs, such as poverty alleviation. To solve this issue, they suggested that e-government applications should be built based on citizens' needs, and in order to gain the interest of citizens, all e-government applications should consider this purpose.

2.4 Environmental point of view

Every country has different political, social, and economical situations, with different issues, concerns, and requirements. Therefore, governments should assess their own risks of e-government project failure, i.e., the chances of a project not meeting requirements, as well as the benefits of successes in government IT projects (Gauld & Goldfinch 2006; Heeks 2003). Because it is not a simple task for governments to assess the risks involved in moving from providing offline services to e-services, Mosquera (2008) states that "e-government projects implementers often come across problems due to bureaucratic tendencies, centralized decision making

patterns, complexity of redundancies in the public sector, lack of coordination and information sharing between and within public institutions, and lack of effective ICT infrastructure, all of which are problems that spawn from overblown and unrealistic expectations that individuals have of information technology".

In 2002, the University of Manchester collected and analyzed data from about forty e-government projects from different developing countries. The study was conducted by the university in order to estimate the percentage of failures, partial failures, and successes in e-government projects. Of all the reported cases, only 15% of IT government projects in developing countries were successful, 50% were partial failures, meaning that deadlines and/or budgets were not met, or actual functionality was different from what was expected, and the remaining 35% resulted in total failure (Heeks 2004). Because governments in developing countries usually follow e-government implementation strategies designed for developed countries without considering the differences between developing and developed countries (Chen et al. 2006), the failure rate of e-government projects in developing countries is higher than developed countries (Heeks 2004).

2.5 Designed artifacts for e-government implementation

Investigating the literature shows that the proposed artifacts for e-government implementation are very few in their quantity comparing to the quantity of investigated success factors (Chen et al. 2009). These proposed artifacts vary between being a proposed model, process, or framework. Overseeing these artifacts shows that they are not created to consider all perspectives related to e-government and even none of them have covered all success factors related to any perspective. Also, most of these

artifacts do not deal with e-government implementation as a process as it should be done with the success factors which have to be maintained together in different times and perspectives during the implementation. As per our review in this research, there are six artifacts have been produced in the literature, and they are summarized and sorted historically.

Chen et al. (2009) proposed a process for e-government implementation from a social perspective. The process was very simple, and it consisted of three stages: 1) *Initiation* where the national government strategy is aligned with the local environment and needs to produce the final e-government strategy, 2) *Actualization* where vertical G2G and G2B partnerships are considered, and 3) *Popularization* where horizontal partnerships are considered. Between the second and third stages, there will be an iterative loop for enhancing the modularization and societal learning as shown in Figure 2.1. By reviewing the proposed process, we can see that it focuses on considering local needs at early stage, and enhancing the modularization. However, the process lacks consideration of other social factors such as user resistance, cultural impact, and privacy requirements.

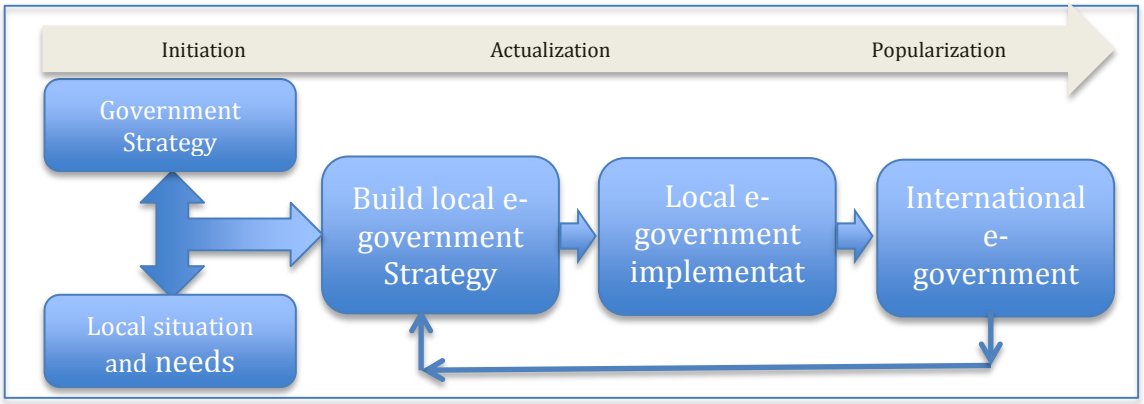

Figure 2.1: Process model of e-government implementation by Chen et al. (2009)

Switching to the political perspective, we find that Heeks (2002) has created a model for identifying the gaps between the design of e-government and the reality of the situation of the country. According to him, ignoring this gap was the main reason for the failure in the implementation of e-government projects in many African countries. After investigating some of these implementations, Heeks outlined the readiness of a country based on the following factors: 1) data system infrastructure, 2) legal infrastructure, 3) institutional infrastructure, 4) human infrastructure, 5) technological infrastructure, and 6) leadership and strategic thinking. Based on that, he proposed a model consisting of six dimensions as follows: information, technology, objectives and values, staffing and skills, management and structure, and others. He suggests using this model in any e-government implementation project to verify the match between these six dimensions in the design and the reality before approving the design. The proposed model is created to deal with the readiness issue, but not with other implementation issues.

From IS perspective, Meneklis and Douligeris (2010) proposed a model for e-government implementation. According to them, the model is built to consider only three factors which are: e-government environment, the stakeholders and their roles, and the needed technology; while other factors were out of their focus. The model presents the stages of each factor that any e-government project may go through them, and it explains the sub-factors under each factor. For example, Meneklis and Douligeris consider that the environment factor encompasses every entity that is not part of the system such as political, legal, financial, and historical circumstances; in addition to the organizational needs and functions. Moreover, they consider that the role factor as the social force affecting the implementation process, and that encompasses all stakeholders and their influence. In fact, the model proposed by

Meneklis and Douligeris has succeeded in displaying the stages of each factor and explaining the goal and legitimation of each stage. However, the model did not set any criteria or sequence for these stages, as well as not showing the steps needed for the implementation process.

From a management perspective, Rose and Grant (2010) have proposed a framework for e-government implementation that considered many aspects such as customer relationship management and program management. According to them, the framework is built based on the assumption that the issues related to e-government implementation are a combination of the program management issues and other issues related to the new commercial issues which are inherited from the marketing literature. Therefore, the researchers gathered the issues related to the subject from the literature of these fields, and listed them in their proposed framework. The model lacks the sequential sort, which is very important in such a huge implementation.

Also, Sinawong et al. (2009) have proposed a model for identifying the readiness of the country for e-government implementation and the needed actions to guarantee the success of the implementation process. They divided the factors affecting the implementation into three categories: managerial, infrastructural, and human factors, and at the same time, they assume that these factors are either contributing or challenging to the implementation process. According to them, filling Table 2.1 helps in diagnosing the status of the country, and identifies its readiness for e-government implementation.

Finally, the most generic framework as per our review is proposed by Sarantis et al. (2011), and named as *eGTPM* which stands for electronic Government Transformation Project Management. The framework deals with the process of e-

government implementation from a project management perspective, and it focuses on what should be achieved rather than on trying to predict timescales and resources for activities as it happens in the traditional project management. Basically, eGTPM method provides a knowledge-rich environment for planning, organizing and monitoring e-government projects on the top of traditional project management methods such as PRINCE or PMI. According to the Sarantis et al., the framework is built based on four concepts which are: 1) goal-driven management which emphasizes on defining milestones that are practical and tangible steps within the project described as a state that must be reached to meet the final objective, 2) knowledge reuse, 3) project result paths which are a series of milestones that are closely related to each other, and tell the implementers about the plan and aims, and 4) stakeholders modeling. Although the framework is the most generic one as per our literature review, there are many factors that are missed such as considering the situation of the country and social impact; in addition to not giving sequential steps for the implementation as it should be obtained in such a huge implementation.

	Contributing	**Challenging**
Management factors		
Infrastructure factors		
Human factors		

Table 2.1: Sinawong et al. (2009) model.

2.6 E-government success factors refinement

The literature review from this chapter has identified 23 success factors that may affect the implementation of any e-government project as shown in Table 2.2. The success factors have been reviewed, and their names have been rephrased in order to be integrated and coherent in one unit as they have been extracted from different

sources. For example, the “Organizational coordination and cooperation between departments” factor has been changed to “Internal coordination”, and the factor “Vision and management strategy” has been changed to “Strategic management”.

Also, the factor “government officers and employees” is excluded from the success factors list, and added to the beneficiaries of the implementation due to their importance and impact on the process. This means that government employees should be treated as all other beneficiaries who are: individuals, organizations, and society. Thereby, the requirements of government employees should be considered, and their trust among other beneficiaries should be maintained, as well as they should be exposed to the new procedures and systems in a proper orientation.

Finally, the success factors are sorted as per their extraction from the literature, and they should be sorted in a logical way in order to be able to create the right model. Therefore, all success factors have been sorted as logically needed. For example, the factor “Strategic management” should be the first factor, while the factor “Political consideration” should come second, and so on. All of these refinements are listed in Table 2.3.

	Success Factor
1	Project management skills
2	Organizational coordination and cooperation between departments
3	Effective leadership support and commitment
4	Vision and management strategy
5	IT skills and IT training programs in government
6	Business process modeling and reinvention
7	Integration skills
8	Semantic heterogeneity
9	Considering complexity of business processes, politics, and political impact
10	Security and privacy
11	Knowledge management
12	Marketing e-government to government employees, citizens, government agents, and other organizations.

13	Financing e-government projects
14	Information architecture / Metadata
15	Beneficiary acceptance
16	Trust between parties
17	Customer orientation
18	Considering the beneficiary needs
19	History and culture of the country
20	Technical staff of the country
21	Infrastructure of the country
22	Citizens of the country
23	Government officers of the country

Table 2.2 Success factors of e-government implementation as extracted from the literature

	Success Factor	**Description**
1	Strategic management	Set the strategic plan for the project
2	Political consideration	Consider politics internally between departments, nationally between ministries and agents, and globally between countries
3	Leadership support	e-government project success requires effective leadership support and commitment
4	Project management (PM)	e-government as any other huge project that require good project management to success
5	Financial management	Bad financial management can fail any project
6	Marketing	e-government project should be marketed to government employees, citizens, government agents, and other organizations in order to success
7	Knowledge management (KM)	The size and time of e-government project requires maintaining the knowledge comes out of the implementation
8	Business process redesign (BPR)	In many cases, government processes have to be redesigned before implementing e-government project
9	Security and privacy management	Depending on the project, e-government project success requires balancing between information security and privacy from one side, and other requirements.
10	Internal coordination	e-government project success requires organizational coordination and cooperation between departments
11	IT qualifications	e-government project success requires identifying and gaining the needed IT qualifications for the project
12	Integration skills	e-government project success requires identifying and gaining the needed integration skills for the project
13	Semantic heterogeneity	Integrity between different parties in terminologies and definitions
14	Beneficiary requirements	Beneficiaries have different requirements and no success without considering their requirements.

15	Information architecture	Information is vast in any e-government project, and organizing it is required to success.
16	Beneficiary trust	e-government project success requires that beneficiary has the tendency to believe in the positive attributes of the project
17	Beneficiary orientation	e-government project success requires that all beneficiaries are allowed to participate implementation
18	Beneficiary acceptance	e-government project success requires convincing the beneficiaries that the implementation will benefit them
19	Previous experience	Related issues, cases, and events that happened in the past may affect the new implementation
20	Local technical capabilities	e-government project success influenced by the availability of the technical resources.
21	Local infrastructure	e-government project success influenced by Local infrastructure
22	Country requirements	e-government project success requires considering the country requirements

Table 2.3 Success factors of e-government implementation after refinement

2.7 Summary of literature review

Implementing e-government is an important topic for governments, society, organizations, and individuals. Reviewing the literature of e-government implementation shows that it can be divided into two parts. The first one is about identifying the factors and issues affecting the implementation process, and these factors can be classified into three point of views: 1) The evolutional point of view, which includes factors such as the need for business process reengineering or business process modeling, semantic heterogeneity, security, privacy, knowledge management, and other software development factors. 2) The beneficiary point of view, which includes factors such as information architecture, metadata, citizen acceptance, trust, and user readiness and willingness. 3) The environmental point of view, which includes factors such as level of maturity for the country, and country needs and directions. The second part is about proposing models and frameworks in order to manage the implementation process. Reviewing the literature shows that these artifacts

are proposed to serve specific perspectives which means that they are not applicable for all cases. Also, these artifacts do not deal with e-government implementation as a process which means that no sequential process for the implementation is provided.

This research will contribute to the field by addressing the following two gaps in the literature:

1. Investigating the literature shows the need for having a comprehensive framework that organizes the process of e-government implementation from all related perspectives because no study research in the literature, as per our investigation, has studied the issues related to the topic of e-government implementation from all related perspectives, and thereby, not all success factors affect e-government implementation are considered in any previous study in the literature. Moreover, e-government implementation project should be treated as one unit, and success factors from all perspectives should be considered together in order to have a successful project (Cater et al. 2004). This study is claimed to consider all success factors affect e-government implementation from all related perspectives.

2. Also, the frameworks produced previously by the literature do not deal with e-government implementation as process while it is a complicated process in reality. Identifying the success factors gives a general idea about what are the obstacles that the people in charge of e-government implementation may face. However, this will not sufficiently explain how to tackle these obstacles and solve them. Therefore, obtaining only the success factors is not a sufficient guide to people in charge to solve the issue successfully. When there is a complex environment such as the government environment where: 1) tackling

the issue requires multiple phases, and 2) the success factors are numerous and interrelated to each other, just identifying and listing the success factors is not a clear guidance to solve the issue successfully. What is needed is a process plan for successful implementation, i.e. a success process. This success process in e-government implementation is an outline, step by step, for the required actions in order to have a successful e-government implementation, and it considers the differences among countries and cultures, i.e. the situational differences.

CHAPTER 3: METHODOLOGY

3.1 Chapter Introduction

This chapter explains the methods used in designing the framework for the success process for e-government implementation. This research follows the design science approach, and the artifacts of the research are validated by qualitative methods and creating a physical instantiation. In this introduction, the scope of the research is defined, and the main stages of the research are described. In the rest of the chapter, these stages are discussed in details, and the methodology that is followed in each stage is explained.

Although the literature shows numerous studies on the success factors of e-government projects in many countries around the world, the approach of this study differs from most of these in that this dissertation is about finding what is needed to have a successful e-government implementation, while most of the other researches are about studying already implemented e-government projects and evaluate their output. West (2000) has conducted a survey to investigate the researches related to e-government implementation inside and outside the U.S. between 2001 and 2006, and he found that most of the researches in the field of e-government implementation are about evaluating already developed e-government websites. These studies were designed to focus primarily on website structure and web features and evaluate the information listed on the government portal without developing an understanding of the underlying factors of e-government implementation (Chen and Perry 2003; Kim and Kim 2003). In contrast, this research has delved below the surface of the web site

and examined the connections between web site features and e-government policy implementation. Also, the study is intended to be holistic and not focusing on one portion of the factors that affect the implementation of e-government.

In addition, a case study method is used to analyze the proposed framework. This helps to delve into the details of e-government implementation. In general, case studies allow for the detailed analysis of complex issues by illuminating the process of implementation (Yin 2002). The sources of the data for this study include primary government documents, several governments' web sites, reviews of the political and administrative situation of the state governments, news articles and in-depth semi-structured interviews of government officials who directed or managed the e-government implementation programs in Saudi Arabia. The researcher also used information that was collected from other research projects. As it is mentioned in chapter 1, the government of Saudi Arabia announced the beginning of the e-government project in 2004, and in spite of the huge budget and plenty of resources assigned to the project by the government, the output of the project is much below expectations. Therefore, the case of e-government in Saudi Arabia seems to be a great opportunity to study and validate the proposed success process framework for implementing e-government.

This dissertation research consists of the following phases: 1) Extract all factors that affect the success of e-government implementation. 2) Create a model that combines all these factors and shows the relationships among them. 3) Propose a generic framework for generating a success process for e-government implementation in any country. 4) Evaluate the proposed framework by generating a physical

instantiation of the success process of e-government implementation in Saudi Arabia. Table 3.1 summarizes the dissertation's phases.

Phase	Description
1	Extract e-government success factors from the literature.
2	Create a model represents the success factors for e-government implementation, and evaluate it.
3	Design a framework for the success process for e-government implementation.
4	Design an instantiation to evaluate the proposed framework.

Table 3.1: Dissertation's phases

3.2 Scope Definition

A main activity in the process of e-government implementation is installing a software application that integrates many systems to provide public services. Therefore, all issues related to software development and systems integration need to be considered in e-government implementation, in addition to legal, social, and cultural issues, as discussed in chapter 2. Issues related to disasters such as earthquakes or wars are out of the scope of this study, as well as issues related to project management. In this section, and in order to define the scope of the research, a comparison between obtaining success factors and success process is given. Also, the criteria for e-government implementation success needs be specified.

To help define the scope of this research, seven questions are asked when measuring organizational performance (Cameron & Whetten 1983) are adapted to the context of e-government implementation and are answered as shown in Table 3.2. Therefore, the scope of this study can be defined as designing a model for e-government implementation that combines all factors mentioned in the literature, and may affect the process of the implementation of any e-government project. Also, a

framework is created for generating an e-government implementation success process that can be used for any country based on clear criteria. In addition to that, the two artifacts are evaluated as required in design science.

S	Question	Answer
1	From which perspective is effectiveness being judged?	• The customers. • the Government
2	What is the domain of the activity?	Services provided by e-government
3	What is the level of analysis?	Individual, organization, and community levels
4	What is the purpose of the study?	Developing a framework for the success process of e-government implementation
5	What is the time frame employed?	Snapshot
6	What types of data are used?	E-government literature, similar IS field literature, and data extracted from interviewing people, in addition to other documents and resources such as previous analysis and studies
7	Against which referent is effectiveness to be judged?	offline vs. online

Table 3.2: Defining the scope of this research

In this research, the guidelines proposed by Fedorowicz and Dais (2010) are followed for creating artifacts in design science, which is based on criteria proposed by other researchers such as Hevner et al. (2004) and Weedman (2008). Also, it is important to mention that the guidelines are well matched with what has been proposed by Simon (1969) in his well-known book: *Science of Artifacts*. The guidelines are summarized in Table 3.3.

3.2.1 Is it success factors or success process?

Identifying the success factors gives a general idea about what are the obstacles that the people in charge of e-government implementation may face. However, this

will not sufficiently explain how to tackle these obstacles and solve them. Therefore, obtaining only the success factors is not an adequate guidance to people in charge to solve the issue successfully. When there is a complex environment such as the government environment where: 1) tackling the issue requires multiple phases, and 2) the success factors are numerous and interrelated to each other, just identifying and listing the success factors is not a clear guidance to solve the issue successfully. What is needed is a process plan for successful implementation, i.e. a *success process*. This success process in e-government implementation is an outline, step by step, for the required actions in order to have a successful e-government implementation, and it considers the differences among countries and cultures, i.e. the situational differences.

#	Guidelines
1	Design science research must produce a viable artifact in the form of a construct, a model, a method, or an instantiation
2	The objective of design science research is to develop technology-based solutions to important and relevant business problems
3	The utility, quality, and efficiency of a design artifact must be rigorously demonstrated via well-executed evaluation methods
4	Effective design science research must provide clear and verifiable contributions in the areas of the design artifact, design foundations and/or design methodologies
5	Design science research relies upon the application of rigorous methods in both the construction and evaluation of the design artifact
6	The search for an effective artifact requires utilizing available means to reach desired ends while satisfying laws in the problem environment
7	Design science research must be presented effectively both to technology-oriented as well as management-oriented audiences

Table 3.3: Design science guidelines (Fedorowicz and Dias, 2010; Simon 1969)

3.2.2 What is a successful process for e-government implementation, and what is the criterion?

There is an adage that "Success is a journey, not a destination" (Humphries 2008) meaning that there should be a process in order to be successful.

According to Middleton (2007), e-government is a program that seeks to enhance the performance of the government itself, and that can be achieved through enhancing the services provided by the government to its beneficiaries and investors. Therefore, the success process for e-government implementation can be related to the success in improving the services provided by e-government to its beneficiaries who are: the government itself (G2G), government employees (G2E), citizens (G2C), and businesses (G2B) (Almarabeh and AbuAli 2010).

On the other hand, the success of e-government implementation depends on the stage of e-government maturity. Because e-government is a continuing process, the development of e-government can be divided into several conceptual stages. Actually, there are several proposed maturity models, but the most widely known one is the model suggested by Layne and Lee (Layne and Lee, 2001) that sees E-government as an evolutionary phenomenon from which E-government initiatives should be derived and implemented. They assume four stages of a growth model for e-government: (1) Cataloguing stage which requires online presence, catalogue presentation, and downloadable forms, (2) Transaction stage which requires the existence of online services and database, (3) Vertical integration stage which requires having local systems linked to higher level systems, and (4) Horizontal integration which requires having systems integrated across different functions and real one stop concept for citizens (Almarabeh and AbuAli 2010).

In addition, there is no one unique success process for implementing e-government that fits for all countries and even one country may have more than one success process as it has been shown in chapter 2. Therefore, a framework that will be used for generating the proper success process of implementing e-government is

proposed in this study. In this research, it has been considered that identifying the criteria for e-government success is an essential step in generating the success process that is proposed by this research. In other words, before starting in e-government implementation, governments should identify the success criteria for their e-government implementation based on their maturity level, services are currently produced to the beneficiaries, and services are needed to be produced.

3.3 Research Methodology

Information Systems in their origin "are implemented within an organization for the purpose of improving the effectiveness and efficiency of that organization" (Henvner et al. 2004). Thereby, researches that aim to approach that purpose should provide their proposed solutions in an organizational context and learn from the interventions between academics and practitioners while addressing a problematic situation (Henvner et al. 2004). In addition, researches have to be compliant with the consensus that focuses on the IS field should have at least one of two missions: 1) contributions to the IS theories, and 2) participation in solving the current and anticipated problems of practitioners (Sein et al. 2011). In the IS academic field, there are two research's paradigms which are: behavioral science and design science (March and Smith 1995). This study will follow design science methodology in order to propose a solution for the aforementioned research problem.

Although of the consensus of the importance of design science and its artifacts in the field of IS (Glass 1999), there are different definitions and taxonomy for these artifacts. This study will follow the classification provided by March and Smith (1995) which classifies the output of the design science into two types: design processes and

design artifacts. They divided the design processes into built processes and evaluated processes, while they divided design artifacts into constructs, models, methods, and instantiations. Based on this classification, Henvner et al. (2004) have determined the cycle of conducting a design research in IS as follows: “This Platonic view of design supports a problem solving paradigm that continuously shifts perspective between design processes and designed artifacts for the same complex problem. The design process is a sequence of expert activities that produces an innovative product (i.e., the design artifact). The evaluation of the artifact then provides feedback information and a better understanding of the problem in order to improve both the quality of the product and the design process. This build-and-evaluate loop is typically iterated a number of times before the final design artifact is generated”.

Based on the classification provided by March and Smith (1995) and the cycle of design research provided by Henvner et al. (2004), Sein et al. (2011) have proposed a new research method called *Action Design Research* (ADR) which aims at generatingprescriptive design knowledge through building and evaluating IT artifacts in an organizational setting. The method consists of four stages and each stage has one principle or more that should be considered during executing the stage. The four stages are: 1) problem formulation, 2) building, intervention, and evaluation, 3) reflecting and learning, and 4) formalization of learning. Despite the simplicity of the method, it has the capability to fulfill the requirements of the design research due the offered flexibility by allowing for iteration and multiple directions as shown in figure 3.1.

According to Henvner et al. (2004), the constructs can be defined as the language that can describe the problem and the solution, while the models can be defined as the reality representation using the constructs in order to aid problem and

solution understanding. Also, according to them, methods can be defined as the processes that provide guidance on how to solve problems, while instantiations show that constructs, models, or methods can be implemented in a working system. They demonstrate feasibility, and enable concrete assessment of an artifact's suitability to its intended purpose.

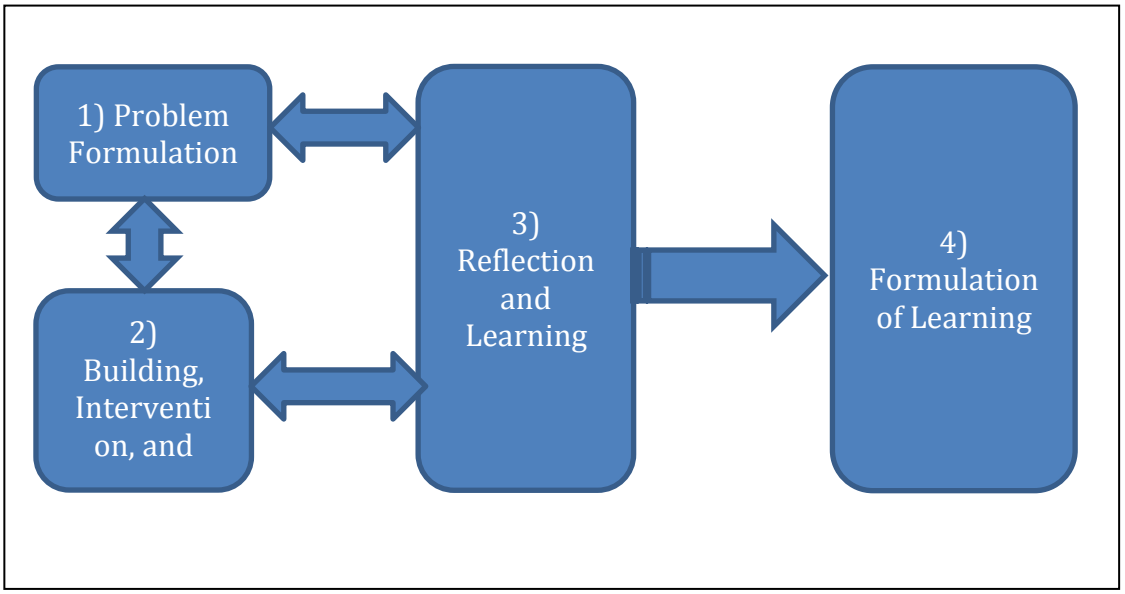

Figure 3.2 ADR Method as proposed by Sein et al. (2011)

The methodology of this study will be a combination of the above design research methodologies provided by March and Smith (1995), Henvner et al. (2004), and Sein et al. (2011), and the outputs of this research are:

1. A design process that is used to create the design artifacts which can be defined in the eight steps listed in the following sections.

2. Three design artifacts which are a model, a method (framework), and an instantiation.

3.3.1 Problem formulation

Formulating the research problem is achieved by identifying and refining the design constructs which can be defined as the language in which the problem and solution are defined. In this research, design constructs are the factors that affect the success of e-government implementations (Hevner 2004). Reviewing the literature of e-government in chapter 2 shows that there are numerous obstacles and success factors related to e-government implementation projects. In that review, it has been shown that e-government implementation project is a mix of software development, systems integration, and public service. Thus, the most appropriate sources for extracting these success factors are the literature of e-government implementation and systems integration; in addition to the literature of software development in general, and the literature that related to applying government rules and procedures in society. Therefore, the constructs of this research are not created from scratch, but the extracted success factors from the literature will be considered as the constructs of the research. These success factors have been reviewed and refined in chapter 2 to avoid any duplication. Also, their names have been rephrased in order to be coherence with each other, and a clear description has been given to each one in order to avoid any conflict or misunderstand.

3.3.2 Building the first artifact

Build a model called *the e-government implementation success factor model*. The main purpose of creating this model is to gather all factors that affect the success of any e-government implementation project in order have the complete picture for the process. This is an essential step for creating a framework for generating the success process for e-government implementation for a government. As a matter of fact, these

factors affect the implementation process in variable percentage due to the situation of the country. Therefore, it would be necessary to gather these factors in one model, and understand the relationship among them.

In this part of the research, the bottom-up approach is chosen in building the model because it is the most appropriate one as it will be shown later in this section. The bottom-up approach can be defined as the process of piecing together of systems to give rise to larger systems, thus making the original systems sub-systems of the emergent system. In a bottom-up approach the individual base elements of the system are first specified in great detail. These elements are then linked together to form larger subsystems, which then in turn are linked, sometimes in many levels, until a complete top-level system is formed. This strategy often resembles a "seed" model, whereby the beginnings are small but eventually grow in complexity and completeness. However, "organic strategies" may result in a tangle of elements and subsystems, developed in isolation and subject to local optimization as opposed to meeting a global purpose (Malone et al. 1996)

Based on the literature review done in chapter 2, the success factors for e-government implementation can be summarized as follows:

- Factors that are related to the beneficiaries of government which are: individuals, organizations, and society.

- Factors that are related to the nature of e-government which is a combination of software developments, systems integration, and public solution.

- Factors that are related to the environment of the country, and its own characteristics.

In fact, these factors are considered as the bottom level in the proposed model, and they are grouped into a higher level called sub-group. Also, the sub-groups are grouped into the highest level which is called group level. For simplification, and because of the total number of success factors, there will be only these three levels which are: factors, sub-group, and group. Figure 3.2 shows a preliminary expectation for the model where there are three groups: Evolutional, Beneficial, and Environmental. The beneficial is divided into individuals, organizations, and society subgroups; the evolutional is divided into SW development, systems integration, and public services subgroups.

From a measurement perspective, we can see that these success factors can be divided into two parts: directly measurable and indirectly measurable factors. The directly measurable factors are usually preferred for experiments because of their easiness in measurement, but unfortunately usually not all phenomena's factors and events are as this type. In contrast, although indirectly measurable factors can be obtained easily, quickly, and inexpensively comparing to the direct ones, they are difficult to be measured (Cushman & Rosenberg 1991). At this stage of the research, the type of each factor is identified, but the measurement strategies are not discussed. The way of measuring each factor is discussed during creating the framework because it is more reasonable to discuss measuring the factors during creating the success process not during creating the model.

Using this methodology in creating the proposed model has some advantages as well as some disadvantages and limitations. Since the model is built based on a deep investigation in the related literature, the model is robust and compatible with previous researches. However the model is limited to the factors mentioned in the

investigated literature. To overcome this limitation, the proposed model is evaluated using an existing case in order to investigate any missing factors. On the other hand, the proposed model is holistic, and it considers different countries and cultures.

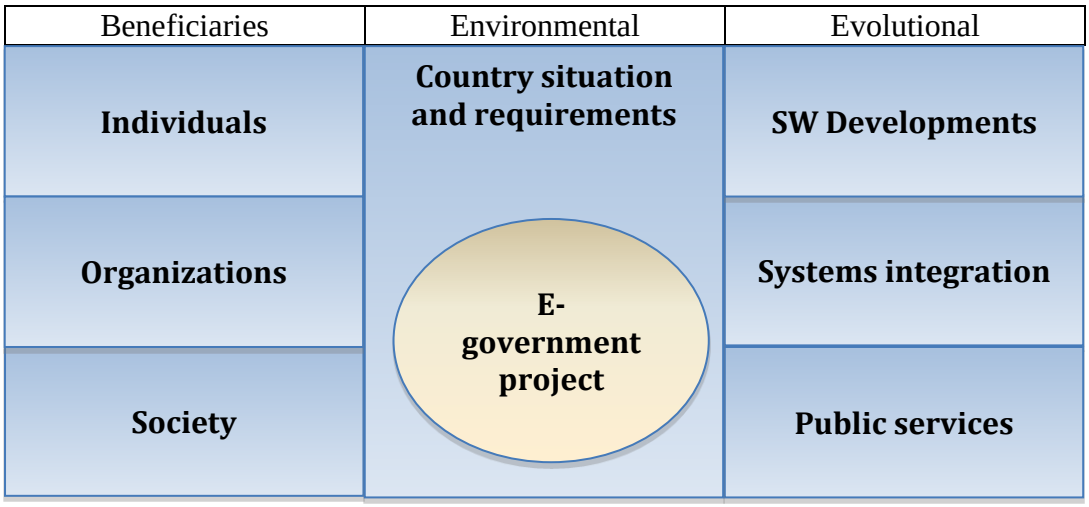

Figure 3.2: A preliminary expectation for the proposed model as a literature output

3.3.3 Evaluating the first artifact

In this step the artifact proposed in the previous step which is the model that aggregates all success factors that can affect the implementation of e-government will be evaluated using a case study which is the project of implementing e-government in Saudi Arabia. The case of e-government in Saudi Arabia has many characteristics that make it the chosen case for the evaluation, as it is shown in details in this section. At the end of this section, the strengths and weaknesses of this evaluation are addressed.

The case study is one of several ways of doing social science research, and it is preferred when the investigator has little control over events, and the focus is on a contemporary phenomenon within some real-life context (Yin 2002). Moreover, the case study approach has a distinctive place in evaluation (Patton 1980). According to

Yin (2002), there are at least five motivations for applying case study in design research which are: explanation, describing, illustration, exploring, and evaluation. In addition, generalizing the results of a case study depends on the selected case and the situation of the phenomena. On the other hand, designing stage is the most difficult part in case study research, and it requires the following four conditions: 1) construct validity, 2) internal validity, 3) external validity, and 4) reliability (Yin 2002).

Grosshans (1990) emphasized on using case studies in evaluation since 1980's, and he defined it as "a method for learning about a complex instance, based on a comprehensive understanding of the instance obtained by extensive description and analysis of that instance taken as a whole and in its context". In addition, he listed several expected benefits of using case studies in evaluation purpose in the design, data collection, analysis, and reporting stages. For example, 1) the ability to match questions asked and later generalization of findings at level appropriate to the questions, 2) assuring that important conditions and reasons will not be overlooked, and 3) assuring of the ability to collect needed data.

Saudi Arabia is an Arabic speaking developing country in the Middle East. The e-government implementation project was announced in 2004 with huge support and funding, but the outcomes of the project to date are way under expectations. This project is selected to be used for evaluating both artifacts based on the following justifications:

1. The nature of the project itself, which appears to have major issues with the outcome so far. Evaluating the research artifacts on such a project may be more effective than evaluating them on a successful project. Applying the proposed framework on this case illustrates what should have been done in the project and

what was missing in the implementation. Also, applying the framework on an unsuccessful project is a good opportunity to notice the improvement in the project and to measure it.

2. The e-government implementation project in Saudi Arabia was started from scratch with no hidden historical factors that might affect the implementation process and complicate the research.

3. Saudi Arabia as a country has varieties in many different aspects which make it adequate for evaluating artifacts. For example, from a structural point of view, Saudi Arabia is a blend of monarchical structure and democracy which means that the proposed artifacts will be examined in both structures. From the country level point of view, Saudi Arabia is considered a developing country, but it has many characteristics of a developed country, such as the quality of transportation and the percentage of people using the internet and other new technologies. Therefore, choosing Saudi Arabia covers, to some extent, aspects from developing as well as developed countries. From a cultural point of view, Saudi Arabia is a mix of well-educated and uneducated, technology oriented and traditional lifestyle, and change-receptive and change-resistant peoples which allow the researcher to examine different reactions.

4. The size of the country and the population size are reasonable for a case study of this kind.

5. The financial situation of the country is excellent, and the government supports and encourages using the latest and best techniques to implement the project.

6. The needed information and the project and contractors are reasonably accessible to the researcher. This has facilitated many required interviews and needed information. Also, having access to different levels of authorities in the project has given the researcher the chance to increase the accuracy of his results.

The government of Saudi Arabia has hired a team of expert people in e-government implementation from all over the world as consultants for the project. The proposed model is evaluated by consulting this expert team. Each member in the team is consulted individually about the success factors of e-government implementation, and the relationships among them. Then, the whole team meets together to discuss the proposed model and to refine it. This has given the team members the chance to review the model individually; then discuss it together and share the information.

3.3.4 Reflecting the results of evaluating the first artifact

Reflect the output of the evaluation on the proposed model, and apply the approved suggestions on the model in order to get the value of the evaluation on the other artifacts.

3.3.5 Building the second artifact

Build a method called *the success process framework*. The main goal of the proposed framework is to initiate objective guidelines for governments or their representatives to generate the success process for e-government implementation. The framework is supposed to be holistic and applicable for all countries and situations. This can be achieved through considering all cases, success factors, and conditions

mentioned in the literature; as well as considering the differences among countries, cultures, and maturity levels of people and systems. The output of this stage is a design for a generic framework that can be used to generate the proper success process for e-government implementation for any country under any condition. The framework considers all e-government implementation success factors identified in the previous stage, and they are structured in a process form. As shown in section 3.3.2, the extracted success factors for e-government implementation can be classified into directly and indirectly measurable factors based on their measurement. Therefore, the proposed framework should have the capability to deal with this diversity, and overcome this difficulty. Creating the framework is done in the following steps: 1) identify measurement criteria, 2) design a full version of the success process, and 3) define the criteria for tailoring the process based on each country conditions.

To continue with what have been created in the previous section, the success factors are reviewed again, and a measuring strategy is created according to the two types mentioned in the previous section which are: directly and indirectly measurable factors. For each directly measurable factor, the range of values is listed, and the inferences of these values are explained. The previous studies will be used as guidance for getting these values and inferences. On the other hand, for each indirectly measurable, objective measurement are created for each factor in order to make them measurable. The literature of each factor is used to create the objective measurement.

The next step is to create a full version of the success process. This helps in having the full image for what has to be done in e-government implementation, and unify the process of the implementation. Then, the full version is customized and tailored based on clear criteria which are created to make the process

applicable for each case. The success factors and their measurements, which are created previously, are used in the customization process. In addition, the previous success processes which have been created in different perspectives, as shown in chapter 2, are considered in creating the full version of the success process. Therefore, all previously produced designs are reviewed and compared to the extracted success factors in order to enhance these designs, and discover any hidden conflict between the factors in these designs. Then, the enhanced design from different perspectives are consolidated in one generic design. At this stage of the research, the top-down approach is used to design the proposed framework as the main methodology starting from the specifying the main goal of the framework, and reach down to the small details of the framework. A top-down approach which is also known as step-wise design can be defined as the process of breaking down of a system to gain insight into its compositional sub-systems. According to the top-down approach, an overview of the system should be formulated, but not detailing any first-level subsystems. Each subsystem is then refined in yet greater detail, sometimes in many additional subsystem levels, until the entire specification is reduced to base elements. A top-down model is often specified with the assistance of "black boxes", these make it easier to manipulate. However, black boxes may fail to elucidate elementary mechanisms or be detailed enough to realistically validate the model (Malone et al. 1996).

The framework is created in a process format, meaning that each success factor is translated into one action or more, and all these actions are sorted in a proper sequence that fits the country status and requirements. For example, if improving the current government processes is one of the objectives of e-government implementation project, then four actions should be embedded in the implementation process which

are 1) gathering the current processes, 2) analyzing them, 3) designing the changes, and 4) implementing the new processes, as shown in chapter 2, these actions may affect, interact, and contradict with actions for other success factors such as the semantic and the information structure factors. The proposed framework arranges and prioritizes these actions. Conflicts and repeated actions should be resolved in order to refine the steps in a process form. Also, a flowchart is used to represent the framework, and additional sub-flowchart may be needed to simplify the output.

The last step in creating the framework is to create the criteria for tailoring the full version of the success process based on the country situation. The need for each success factor and the way of dealing with it are extracted from the literature and reformulated in criteria that are added to the full success process to facilitate needed customizations. The status of the country and the requirements of the government are translated into criteria form, and added to the flowchart. Most of these criteria are represented in IF condition format. At this stage, it is possible to prioritize the success factors based on the country situation and needs, and restructure the framework accordingly.

Using this methodology in creating the proposed framework has some advantages, some disadvantages, limitations, and challenges. The efficiency of the proposed framework is based on the accuracy of the model proposed in section 3.3, and any missing factors may affect the framework progress. To overcome this limitation, the process of creating the framework is delayed until the model is evaluated and enhanced by a case study that is explained in the following section. One of the challenges in creating this framework is solving the contradictions between the

success factors. For example, focusing on the privacy success factor may create conflicts with other success factor such as security.

3.3.6 Building the third artifact

To evaluate and refine the framework for e-government implementation which is proposed in the previous step, a physical instantiation is developed using the proposed framework for a selected task in the project of e-government implementation in Saudi Arabia. The implementation of this instantiation is evaluated using a method called "Extensive or thick analysis" which is based on analyzing data from multiple sources such as interviews, observation over time, participant observation, documents, archives, and physical information (Grosshans 1990). Also, after the implementation, sort of interviews and investigations are conducted to discover whether an implementation of a project is in compliance with congressional intent or not. Descriptive and normative questions are used in order to explore how the implementation has been achieved, which requires investing a great deal on site to get longitudinal data, having access to key people and other important sources, asking questions in details, and taking notes in organized way. Finally, the task which has been performed using the developed instantiation is compared with a similar task that has been performed using the traditional way. This allows the evaluator to assess the impact of applying the instantiation. Since there is only one evaluator, the main disadvantage of this method, which is the impact of the interviewer, is reduced (Grosshans 1990; Yin 2002; Patton 1980).

In this evaluation, a qualitative case study is used to evaluate the output of the instantiation rather than a quantitative case study, due to the complexity of the

evaluation that requires person-to-person interviews to discuss any missing factors or any possible enhancements to the model or the framework. Quantitative methods would not allow this flexibility to the researcher. Although the use of the case study in this research is only for evaluation purposes, it should be in compliance with all researching validations. These validations that needed to be met are: construct validity, measurement validity, internal validity, and external validity as follows:

1. Evaluation constructs: the evaluation of the new design is about its added value in term of time, cost, and number of labors.

2. Construct measurement: to achieve measurement validity, there two tactics: multiple sources of evidence, and using the chain-of-evidence technique in data reduction. In this research, the first tactic is followed because of the available resources in the case. The multiple sources of evidence are official documents, articles, interviews, and reports (Neustadt & Fineberg 1978; Yin 1989).

3. Internal validity: Although there are overlaps between measuring the added value of the new design in term of time, cost, and labor, since they all can be counted as cost at the end, the evaluator is able to distinguish between them due to the simplicity of comparing only two cases, which are the project without using the new design, and the project after using it.

4. External validity: the result of this evaluation can be generalized on other countries similar to Saudi Arabia such as countries in the Middle East, and generalizing the design to other regions will be left for future researches.

3.3.7 Reflecting the results

Reflect the output of the results of building the instantiation in the fourth step on the proposed method created in the fifth step.

3.3.8 Formulate the produced artifacts, and generalize the results

Finally, generalizing the results of evaluating the proposed framework is based on the framework proposed by Lee and Baskerville (2003). According to them, "to claim a theory will remain valid beyond the observed case (i.e., capable of generalizing valid descriptions of field settings not yet observed) would require accepting the uniformity of nature proposition, the validity of which is not established, and the attempted proof of which would trigger the infinite regress identified in Hume's truism". Moreover, they concluded their study by stating that despite the criticisms claiming that case studies are not generalizable correctly because they have no generalizability beyond the given case, the notion of the generalization of empirical descriptions to theory is well developed as it has been approved by several studies.

Therefore, to overcome this particular lack of generalization, which is not only a feature of qualitative studies but also statistical sampling-based studies, the findings with respect to evaluating the artifact are generalized based on clear characteristics of the environment. This means that the results of this evaluation can be generalized only to other environments similar to Saudi Arabia, and determining the applicability of the results to other regions is left to future research.

3.4 Research Artifacts

This design research produces three artifacts which are: 1) a model that represents the success factors for e-government implementation as extracted from the literature of e-government in order to obtain a generic and holistic picture of this research topic area, 2) a comprehensive framework for designing a success-process for government implementation which is developed based on the proposed model because there is no single success-process for implementing e-government will likely fit all government environments, as has been shown by many published studies, and 3) a physical instantiation for a selected task in the project of e-government implementation in Saudi Arabia which will be used to evaluate the proposed framework (Table 3.4).

S	Research Artifacts
1	Designing a model represents the success factors for e-government implementation as extracted from the literature.
2	Designing a framework for the success process of e-government implementation.
3	Designing a physical instantiation for part of the project of e-government implementation in Saudi Arabia.

Table 3.4 Research artifacts

CHAPTER 4: E-GOVERNMENT IMPLEMENTATION SUCCESS FACTOR MODEL

4.1 Chapter Introduction

The main purpose of this chapter is to create the first artifact in this research which is a model that represents all factors that affect the success of any e-government implementation project in order to have a complete picture for the process. These success factors affect the implementation process to variable degrees, depending on the political, social, and economic environment of the country. Therefore, it is necessary to gather these factors into one model and get an understanding of the relationships among them, especially as, to our knowledge, there has not been any previous study published in the literature that integrates all success factors from all perspectives affecting e-government implementation.

In chapter 2, it has been shown that e-government implementation, as a project, is a mix of software development, systems integration, and public service. Thus, the most appropriate sources for extracting success factors affecting the process of e-government implementation are the literature of e-government implementation and systems integration; in addition to the literature of software development in general, and the literature that is related to applying government rules and procedures in society. Also, it has been shown in the same chapter that the environment of e-government implementation is a complex environment because there are variations in policies, services to be implemented, legislative and executive commitment, agency policies, and individual content providers. These complexities were examined in detail

by investigating the literature, and that is the base for creating the proposed model to represent all factors affecting e-government implementation. Based on the literature review done in the chapter, the success factors for e-government implementation can be summarized as follows:

1. Factors that are related to the beneficiaries of government which are: individuals, organizations, and society.

2. Factors that are related to the nature of e-government which is a combination of software developments, systems integration, and public solution.

3. Factors that are related to the environment of the country, and its own characteristics.

In chapter 3, it has been decided that the bottom-up approach is chosen in building the model because it is the most appropriate one as it has been shown in the chapter. The bottom-up approach can be defined as the process of piecing together of systems to give rise to larger systems, thus making the original systems sub-systems of the emergent system. In a bottom-up approach the individual base elements of the system are first specified in great detail. These elements are then linked together to form larger subsystems, which then in turn are linked, sometimes in many levels, until a complete top-level system is formed.

In the following sections, the success factors of e-government implementation extracted from the literature are used to design the e-government implementation success factor model. Next, from measurement perspective, the idea of how each success factor can be measured is discussed based on what is given in the literature.

Finally, the advantages, disadvantages and limitations of the proposed model are listed.

4.2 Creating e-government success factors subgroups

In section 2.5, twenty two success factors of e-government implementation have been refined and sorted as they were extracted from the literature. A quick look at these factors and a comparison to what is mentioned in chapter 2 tell that these success factors can be classified into different subgroups and groups. Therefore, and in order to be consistent with the dissertation methodology, the given success factors which are listed in Table 2.3 are classified into subgroups as it was deduced from the literature.

Firstly, there is a group of subgroups that share the same e-government implementation success factors which are: beneficiary requirements, information architecture, trust among beneficiaries, beneficiary orientation, and beneficiary acceptance success factors. These subgroups can be narrowed in the following subgroups: *individuals, government's employees, organizations*, and *society*. These subgroups are completely interrelated to each other, and there are overlaps in dealing with them on the success factor level. For example, getting individuals acceptance may contradict with other parties' acceptance such as the employees in the government and the organization. Table 4.1 shows the four subgroups and their success factors.

Secondly, there is a subgroup contains all other success factors that are related to the country situation and requirements. This subgroup is called *environmental* subgroup, and it contains four success factors as shown in Table 4.2.

S	Success factor	1)Individuals	2)Employees	3)Organizations	4)Society
1	Beneficiary requirements	v	v	v	v
2	Information architecture	v	v	v	v
3	Beneficiaries trust	v	v	v	v
4	Beneficiary orientation	v	v	v	v
5	Beneficiary acceptance	v	v	v	v

Table 4.1 Success factors in individuals, government employees, organizations, and society subgroups

S	Success factor	5)environmental
1	Previous experience	v
2	Local technical capabilities	v
3	Local infrastructure	v
4	Country requirements	v

Table 4.2 Success factors the environmental subgroup

Finally, there is a group of subgroups that share almost the same e-government implementation success factors. The first subgroup is called *software development* (SWD) which covers all success factors related to e-government implementation as a pure technical task. The second subgroup is called *systems integration*, and it includes all success factors related to integrating the systems. The third one is called *public services*, and it includes all factors related to e-government as a public services' provider. Table 4.3 shows the success factors which are chosen for these subgroups, and it shows that most of the mentioned success factors are considered under more than one subgroup. Despite of that salient overlaps that can be noticed between the success factors, there are no overlaps in dealing with them, and they can be considered simultaneously. This is due the nature of these subgroups where they are totally isolated from each other. For example, although security as a success factor is shared between all mentioned subgroups, dealing with security will vary from one subgroup

to another. There is no conflict or overlap in the requirements for security as software development (SWD), systems integration, and public services, and the requirements can be taken as one unit or easily divided between the subgroups. A more detailed and realistic example is given in chapter 6 during evaluating the model.

4.3 Creating e-government success factors groups

After refining and classifying the 22 success factors for e-government implementation into eight subgroups, it has become obvious that we will continue with what we started in the second and third chapters, and the eight subgroups should be reconciled into three main groups which are: *beneficiaries, evolutional, and environmental*. Tables 4.1, 4.2, and 4.3 present the success factors under each subgroup.

The evolutional group contains three subgroups which are: SWD, systems integration, and public services. These subgroups share almost the same success factors in different level as explained in the security example in the previous section. The given example justifies choosing these three subgroups for the evolutional group. Also, the beneficiaries group contains four subgroups which are: individual, government employees, organizations, and society. These subgroups share exactly the same success factors, and there will be expected overlaps and contradiction between subgroups in dealing with this group as explained in the previous section. Creating these two groups means that there is one subgroup remaining without a group which is the environmental subgroup. Because of the importance of this subgroup and it impact on the other groups, it will be considered as a group by itself. Figure 4.1 shows the process of e-government implementation and the success factors groups.

S	Success factor	6)SWD	7)Systems integration	8)Public services
1	Strategic management	v	v	v
2	Political consideration	v	v	v
3	Leadership support	v	v	v
4	Project management	v	v	v
5	Financial management	-	v	v
6	Marketing	v	-	-
7	KM	-	v	v
8	BPR	-	v	v
9	Security and privacy	v	v	v
10	Internal coordination	v	v	v
11	IT qualifications	v	v	-
12	Integration skills	v	v	v
13	Semantic heterogeneity	v	v	-

Table 4.3 Success factors in SWD, systems integration, and public service subgroups

4.4 Creating the e-government success factors model

Based on the literature of e-government implementation, we can see that the environmental group which contains only one subgroup is surrounding the process of e-government implementation, while other two groups can influence the implementation process through the environmental group. This is because e-government implementation is a national project, and it gets affected by the situation of the country in all aspects. Also, the impact of the success factors within the beneficiaries group is represented as a parallel impact which means that all success factors affect their subgroups at the similar levels with expected overlaps and contradictions as explained in sections 4.3 and 4.4. This important note should be considered during any e-government implementation, and it is presented in the proposed model as horizontal boxes represent the related subgroups. On the other hand, the impact of the success factors within the evolutional group is represented as a serial impact which means that the impact of the success factors will affect the their

subgroups at different levels with no expected overlaps and contradictions as explained in the previous sections. This is represented in the proposed model as vertical boxes that represent the related subgroups.

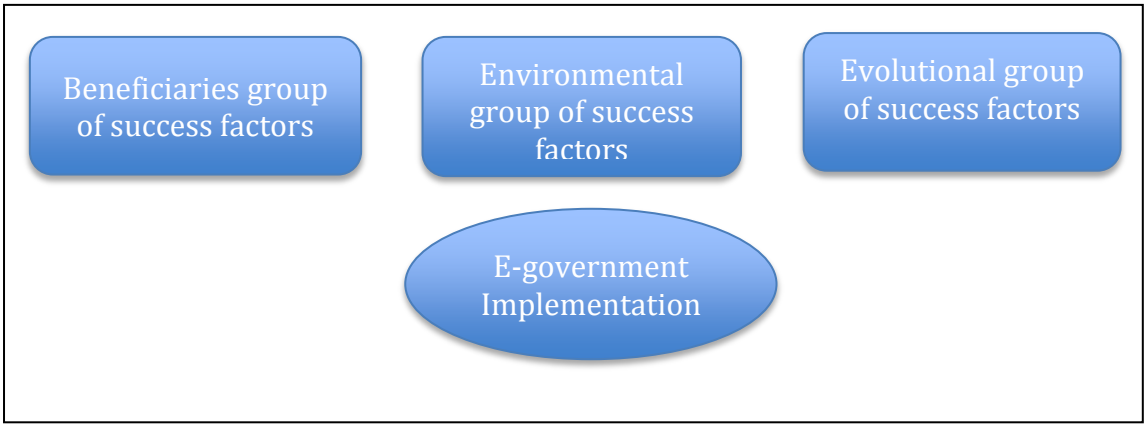

Figure 4.1: E-government implementation and the success factors groups

By combining all what we have got so far in this research, Figure 4.2 shows the proposed model for the success factors of e-government implementation. The model shows the importance of the country situation in the implementation, and it shows the parallel and serial impact of the evolutional and beneficiaries groups on the implementation. Also the model shows the groups that affect the e-government implementation are divided into subgroups except for the environmental group which consists of only one subgroup. Finally, the e-government implementation success factors are not represented in the proposal model due to their number which is 22 factors. However, Table 4.4, which contains all of these success factors and their subgroups, is attached to the model.

4.5 e-government success factors measurements

The term measurable refers to the ability of assessing the amount of how much a success factor is considered in a project of e-government implementation, and assigning a numerical value to represent that amount of consideration. This need has

resulted after overlooking at the extracted success factors, and finding that all of them are flexible terms, and they may have different interpretations. Thus, it is important to set a specific definition and clear criteria to each success factor, and assigning a specific value to each possible condition for each success factor. Therefore, and in order to design the proposed framework for the success process of e-government implementation, the measurements for all the success factors should be determined. In this section, the success factors of e-government implementation are explored from two perspectives. The first one is how to measure these success factors which will be called measurability type, and the second is about the most proper time to measure them which will be called measurability timing in this research.

From measurability type perspective, we can see that these success factors can be classified into two parts: *directly measurable* and *indirectly measurable* factors. The directly measurable factors are usually preferred for experiments because of their easiness in measurement, but unfortunately usually not all phenomena's factors and events are of this type. In contrast, although indirectly measurable factors can be obtained easily, quickly, and inexpensively comparing to the direct ones, they are difficult to be measured (Cushman & Rosenberg 1991). At this stage of the research, the type of each factor is identified, but the measurement strategies are not discussed at this stage. The way each factor is measured is discussed in chapter 5, where the design of the framework is described; it seems more reasonable to discuss the measuring of the factors in conjunction with the design of the success process, rather than with the design of the model.

From the measurability timing perspective, the success factors can be classified also into two parts: factors that needed to be measured before the beginning of

implementing e-government (*pre-implementation*), and factors that cannot be measured except during or after the implementation (*during-implementation*). For example, as the strategy of the implementation should be set before starting the implementation, measuring its readiness needed to be measured before the implementation too. However, the beneficiaries' acceptance cannot be measured except during or after the implementation.

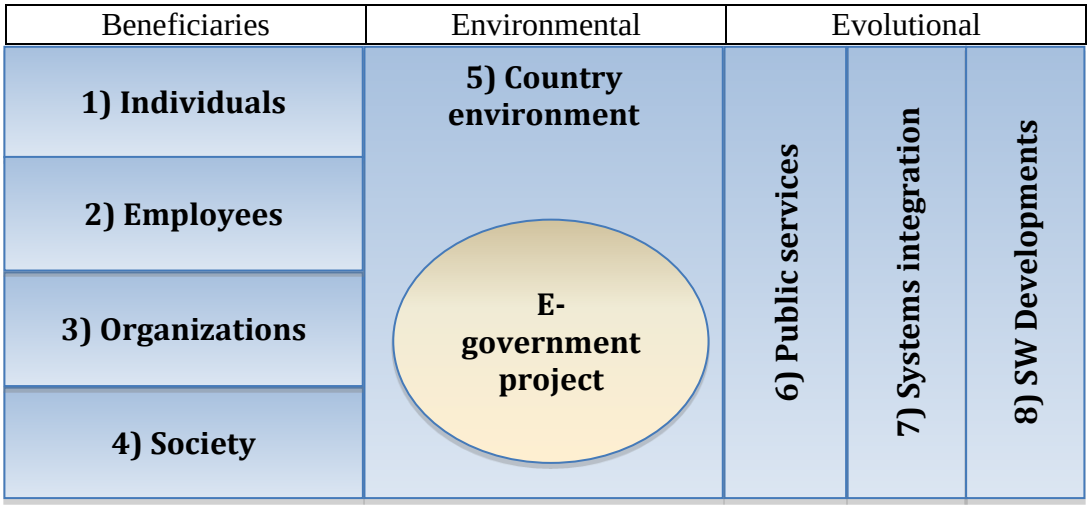

Figure 4.2: The proposed model for the success factors of e-government implementation as a literature output

Investigating the list of extracted success factors and reviewing the literature show that all of the success factors are indirectly measurable. Moreover, it has been noticed that 15 factors in the list needed to be measured before starting the implementation process, and only 7 success factors are needed to be measured during the implementation. Table 4.5 shows the measurability type of each success factor.

	Success Factor / Subgroup	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Strategic management	v	v	v	v	v	v	v	v
2	Political consideration						v	v	v
3	Leadership support						v	v	v

4	Project management (PM)					v	v	v	v
5	Financial management							v	v
6	Marketing					v	v		
7	Knowledge management (KM)						v	v	v
8	Business process redesign (BPR)							v	v
9	Security and privacy management						v	v	v
10	Internal coordination						v	v	v
11	IT qualifications						v	v	
12	Integration skills						v	v	v
13	Semantic heterogeneity						v	v	
14	Beneficiary requirements	v	v	v	v				
15	Information architecture	v	v	v	v				
16	Beneficiaries trust	v	v	v	v				
17	Beneficiary orientation	v	v	v	v				
18	Beneficiary acceptance	v	v	v	v				
19	Previous experience					v			
20	Local technical capabilities					v			
21	Local infrastructure					v			
22	Country requirements					v			

Table 4.4 Success factors of e-government implementation and their related subgroups

4.6 Chapter conclusion

In this chapter, a model that represents all success factors for e-government implementation has been proposed as they are extracted from the literature. The success factors have been gathered into eight subgroups, and there by the subgroups gathered into three groups. The proposed model represents the groups and belonging subgroups; while the attached table lists the success factors and their relationships with the groups and subgroups. Moreover, the success factors have been classified from measurability type perspective as direct and indirect measurable factors, and from timing perspective, they have been classified into pre-implementation and during-implementation measured factors.

Creating the proposed model using this methodology has some advantages as well as some disadvantages and limitations. Since the model is built based on a deep investigation in the related literature, the model will be robust and compatible with previous researches. However the model is limited to the factors mentioned in the investigated literature. To overcome this limitation, the proposed model is evaluated using an existing case in order to investigate any missing factors. On the other hand, the proposed model will be holistic because it considers different countries and cultures.

	Success Factor	**Measurability**	**Timing**
1	Strategic management	Indirect	Pre-implementation
2	Political consideration	Indirect	Pre-implementation
3	Leadership support	Indirect	Pre-implementation
4	Project management (PM)	Indirect	During-implementation
5	Financial management	Indirect	Pre-implementation
6	Marketing	Indirect	Pre-implementation
7	Knowledge management (KM)	Indirect	During-implementation
8	Business process redesign (BPR)	Indirect	Pre-implementation
9	Security and privacy management	Indirect	During-implementation
10	Internal coordination	Indirect	Pre-implementation
11	IT qualifications	Indirect	Pre-implementation
12	Integration skills	Indirect	During-implementation
13	Semantic heterogeneity	Indirect	Pre-implementation
14	Beneficiary requirements	Indirect	Pre-implementation
15	Information architecture	Indirect	During -implementation
16	Beneficiaries trust	Indirect	Pre-implementation
17	Beneficiary orientation	Indirect	Pre-implementation
18	Beneficiary acceptance	Indirect	Pre-implementation
19	Previous experience	Indirect	Pre-implementation
20	Local technical capabilities	Indirect	Pre-implementation
21	Local infrastructure	Indirect	Pre-implementation
22	Country requirements	Indirect	Pre-implementation

Table 4.5 Success factors of e-government implementation measurement types

CHAPTER 5: E-GOVERNMENT IMPLEMENTATION SUCCESS PROCESS FRAMEWORK

5.1 Chapter Introduction

This chapter is the core of this dissertation because the main output of the research which is the framework for e-government implementation success process is produced in this chapter. The proposed framework is built to be able to consider all success factors mentioned in the literature of e-government implementation, and combine them in one process in order to be useful and practical. This is due to the fact that e-government implementation is a single project, and all issues related to e-government implementation from different perspectives should be considered and treated as one unit. Moreover, the proposed framework is built based on the model proposed in chapter 4 and evaluated in chapter 6. Noting that creating the framework is delayed after evaluating the proposed model in order to be able to apply the approved changes in the evaluation on the framework.

Any framework in its origin is a structure for supporting or enclosing something else, especially a skeletal support used as the basis for something being constructed. Also, it could be a real or conceptual structure intended to serve, support, or guide for the building of something that expands the structure into something useful. There are many types of framework such as SW, legal, and process framework

(Almarabeh and AbuAli 2010; Chen et al. 2006; Evans and Yen 2005). The proposed framework of this dissertation is a process framework.

In chapter 2, six proposed frameworks for e-government implementation have been studied, and they are considered in designing the proposed framework. As per the provided brief about each framework, they are designed to serve specific perspectives; for example, Chen framework was designed to emphasize on the importance of considering the social and local influence of the process of e-government implementation. At the same time, Chen framework has ignored other important factors such as having specific strategy for the implementation process. Therefore, the proposed framework in this research is claimed to be different from the previous frameworks in two aspects: 1) being holistic which means that it is applicable for all countries and situations, and it also considers all issues and factors mentioned in the literature of e-government implementation, and 2) being in a process format in order to be more useful and practical for e-government projects implementers.

As mentioned in the methodology of this dissertation in chapter 3, the proposed framework is built in three steps: 1) identify measurement criteria for every extracted success factor, 2) design a full version of the success process of e-government implementation, and 3) define the criteria for tailoring the process designed in the second step based on each country conditions. Thus, the following three sections of this chapter are dedicated to producing the three steps, and the last section of this chapter is to conclude and summarize the whole framework. Moreover, the framework as well as the model is evaluated in chapter 6 using one case study as mentioned in chapter 3.

5.2 Identifying measurements for e-government implementation success factors

This section of the research is a complement for what has been done in section 4.6 which was about identifying measurements for the extracted success factor in order to design a useful framework for e-government implementation. In section 4.6, the success factors have been classified into four types: 1) directly measurable before the implementation, 2) directly measurable during the implementation, 3) indirectly measurable before the implementation, 4) indirectly measurable during the implementation. Also, it has been deduced based on the literature that all success factors are ranging only between the third and fourth types. In this section, the output of investigating the literature in chapter 2 is utilized to identify how to measure these factors. Therefore, all listed success factors are studied one by one in order to identify a precise way for measuring each one of them.

After investigating each success factor, and due to their mentioned importance in the literature, it has been decided that only one of two values will be assigned to each success factor. The value will be either one which means that all issues related to the success factor are considered, or zero which means that not all issues related to the success factor are considered. Based on the literature, it has been figured that to consider some of the issues related to a specific success factor is equivalent to not considering all of them. Therefore, there will be no value assigned to the success factors for partial consideration, and only two values will be possibly assigned to each success factor (Table 5.1).

Values	Meaning
0	Some or all of the issues related to the success factor are not considered.
1	All issues related to the success factor are completely considered.

Table 5.1 Values for measuring success factors

The next step is to determine meanings for all values that can be assigned to each success factor. Based on the literature review in chapter 2, and because there are only two values for each success factor, completion conditions have been dedicated for each success factor in order to identify whether the success factor is completely considered or not. For example, the first element in the success factors list, which is the "strategic management" factor, is used in three subgroups, and it should be measured before starting the implementation of the project as it has been mentioned in the proposed model. This factor will be assigned as completely considered if the following conditions are completely achieved: 1) identify the project's requirements, 2) set the rules for solving expected conflicts between privacy & security, conflicts between beneficiaries in acceptance and requirements, and conflicts in semantic heterogeneity, and 3) plan for supporting, managing, financing, and marketing for the implementation. Also, the third factor in the success factors list, which is the "leadership support" factor, is used in three subgroups, and it should be measured before starting the implementation of the project as it has been mentioned in the proposed model. This factor will be considered as completely satisfied if the following conditions are completely achieved: 1) having access to information and locations, 2) ability to modify needed processes, and 3) facilitate the needed manpower. The details of these conditions are listed in Table 5.2 for each success factors.

	Success Factor	**Conditions of completion**	**Timing**
1	Strategic management	1. Identify the project's requirements. 2. Set the rules for solving expected conflicts between privacy & security, conflicts between beneficiaries in acceptance and requirements, and conflicts in semantic heterogeneity. 3. Plan for supporting, managing, financing, and	Before

		marketing for the implementation.	
2	Political consideration	1. Gathering all government's policies that are related to the project. 2. Set general regulations for the projects.	Before
3	Leadership support	1. Access to information, locations, and people. 2. Modifying needed processes. 3. Manpower availability.	Before
4	Project management (PM)	1. Maintain project life cycle. 2. Determine the stakeholders, manpower, and timeframe. 3. Create and maintain project plan.	During
5	Financial management	1. Acquire assigned budget. 2. Support for unexpected extra cost.	Before
6	Marketing	Combine the output of success factors 14-18 in order to create unified marketing plan serves all beneficiaries.	Before
7	Knowledge management (KM)	1. Plan for launching knowledge management projects within their e-government projects. 2. Maintain Knowledge life cycle within the project.	During
8	Business process redesign (BPR)	All processes should: 1. Fit into the current government strategies and directions. 2. Be compatible with e-government requirements. 3. Modify processes that not complying with the above.	Before
9	Security and privacy management	1. Define the technical aspect of security such as threats from hackers and viruses 2. Define the organizational aspect of security such as lack of security rules and policies. 3. Define the privacy requirements. 4. Match between security and privacy requirements.	During
10	Internal coordination	1. Gathering all internal issues and constrains that are related to the project. 2. Match the above issues with policies listed for factor 2.	Before
11	IT qualifications	Gathering all needed IT qualifications for completing the project.	Before
12	Integration skills	Gathering all needed integration qualifications for completing the project.	Before
13	Semantic heterogeneity	1. Solve all issues related to ontology among all parties as decided by the strategy. 2. Match that with previous implementations.	Before
14	Beneficiary requirements	1. Gather the requirements of all beneficiaries. 2. Combine and solve conflicts.	Before
15	Information architecture	1. Using Metadata as a tool to improve multiple functions. 2. Consider all beneficiaries issues listed in factors 14, 16, and 18.	During

16	Beneficiaries trust	Consider the following for all beneficiaries: 1. Disposition to trust, which is the tendency to believe in the positive attributes of others 2. Familiarity, which is a stage where people use their previous experience. 3. Institution-based trust, which is the reaction that will be imposed when trust is breached. 4. Perceived usefulness, which is the degree to which the user believes in the system. 5. Perceived ease of use, which is the degree to which the user believes that using the system is easy and free of hard effort.	Before
17	Beneficiary orientation	All beneficiaries should be allowed to participate in three stages: 1. Collecting information 2. Disseminating information 3. Maintaining information.	Before
18	Beneficiary acceptance	1. Propose alternatives for the requirements that will not be provided. 2. Convince the beneficiaries with the proposed alternatives.	Before
19	Previous experience	Gathering all issues, cases, and events that are related to the project.	Before
20	Local technical capabilities	1. List all available technical capabilities for the project. 2. Match the available technical capabilities with the needed ones listed for factor 11 and 12.	Before
21	Local infrastructure	1. List the details of the local infrastructure related to the project. 2. Match the details with the needed ones listed for factor 11 and 12.	Before
22	Country requirements	1. Gather all issues related to the nature of the country. 2. Provide them to the project manager to consider.	Before
23	Cultural influence	1. Gather all issues that may affect the implementation. 2. Provide them to the project manager to consider.	Before

Table 5.2 E-government implementation success factors measurements

5.3 Designing a full version framework for the success process

In this section, a full version of the success process is created. This helps in having the full image for what has to be done in e-government implementation, and

unify the process of the implementation. In the next section, the full version is customized and tailored based on clear criteria which are created later on in order to make the process applicable for each case. The success factors and their measurements, which are created previously, are used in creating the success process, and the previous proposed frameworks which have been created for different perspectives, as it has been shown in chapter 2, are considered in creating the full version of the success process framework.

Similar to the three stages proposed by Chen et al. (2009) in their proposed framework, the proposed framework in this dissertation is also divided into three stages which are: 1) *initiation*, 2) *actualization*, and 3) *implementation*. In each stage, there is some sort of actions to deal with specific success factors, in addition to planning for other success factors. By the end of the third stage, all of the success factors should be covered at least once. This is compatible with the dissertation methodology where it has been decided to use the top-down approach at this stage of the research to design the proposed framework as the main methodology starting from the specifying the main goal of the framework, and reach down to the small details of the framework.

In the first stage, the initiation, only one success factor is dealt with while there are five success factors for which are planned. The "strategic management" success factor is the starting point for this framework, and based on it, the whole framework is formed. During dealing with this success factor, the e-government startup team should determine the followings: 1) identify the project's requirements, 2) set the rules for solving expected conflicts between privacy and security, conflicts between beneficiaries in acceptance and requirements, and conflicts in semantic heterogeneity,

and 3) plan for supporting, managing, financing, and marketing for the implementation. In addition, startup team should create and nominate members for five teams which are 1) marketing and customer relationships team, 2) project management team, 3) policies and regulations team, 4) financing team, and 5) leaders support team for the project. These five teams work together to make a successful implementation for the e-government project, and they are in charge for considering the other success factors. Also, the e-government startup team should identify the relationship between this implementation and other government's implementations if any. Achieving the mentioned requirements leads to create a clear path for the implementation, and it is used as a reference that can help in avoiding conflicts that may appear during executing the project.

In the second stage, the actualization, the five teams should be created. Each team leader should start planning for his team and coordinate with other team leaders to facilitate services among their teams. First, the marketing and customer relationships team leader should consider the following success factor while creating the marketing plan: security and privacy, beneficiary requirements, information architecture, beneficiaries trust, beneficiary orientation, and beneficiary acceptance, as well as considering the previous experience and cultural influence factors. This will make implementing the project of e-government marketable for all of its beneficiaries. The marketing and customer relationships team leader should also follow the strategy and regulation rules to set the priority between the beneficiaries, and solve any conflict that may appear. Second, the project management team leader should focus on maintaining the project life cycle, and plan for the needed resources for archiving his tasks. In general, the project management team leader should consider all technical issues related to the success factors: semantic heterogeneity, integration skills, IT

qualifications, and information architecture, as well as, issues related beneficiaries requirements, trust, and acceptance, in addition to other business issues related to the success factors: internal coordination, business process redesign, knowledge management, previous experience, local technical capabilities, local infrastructure, country requirements, and cultural influence. Also, the project management team leader should consider the security and privacy factor from both technical and business sides. Third, the policies and regulations team leader should plan for gathering all government's policies that are related to the project, and he should consider issues related to the success factors: security and privacy, semantic heterogeneity, integration skills, information architecture, internal coordination, business process redesign, country requirements, and knowledge management, as well as, issues related to beneficiaries requirements, trust, and acceptance. Fourth, the finance team leader should create the project budget, and arrange for unexpected extra cost, as well as, matching between the project activities and expected cash flow in order to guarantee smooth progress for the project. This requires some sort of meetings and discussion with the project management team and the support team. Finally, the leaders support team leader should arrange for accessing needed information and locations, getting authority for modifying needed processes, and acquiring the required resources. Also, the team leader should manage and plan for issues related to the success factors: security and privacy, semantic heterogeneity, integration skills, IT qualifications, and business process redesign, as well as, issues related beneficiaries requirements, trust, and acceptance, in addition to other business issues related to the success factors: internal coordination, and country requirements.

In the third stage, implementation, we have reached to the level where every person who is in charge of success factors should perform the tasks related to that

success factor after coordination with the upper team(s) leader that are linked to the success factor. For example, the person who is in charge for the sematic heterogeneity should perform the related task mentioned in Table 5.2 after coordination with the leaders of the teams linked to that success factor which are project management team, policies and regulations team, and leaders support team. This means that each team leader has to coordinate with linked success factors in order to avoid any expected conflict in such a huge project. Table 5.3 shows the match between the stages of e-government implementation as proposed by Chen et al. (2009) and the proposed framework, and Table 5.4 shows the relationships between the suggested implementation teams and the success factors of e-government implementation.

Now, the full version for the framework of the success process for e-government implementation is ready to be created and produced. It consists of 12 steps as follows:

1. In the 1st step, the strategy for the whole project should be defined. This includes conducting the steps that have been listed in this section under the strategic management factor which are:

    a. Identify the project's requirements.

    b. Set the rules for solving expected conflicts between privacy & security, conflicts between beneficiaries in acceptance and requirements, and conflicts in semantic heterogeneity.

    c. Plan for supporting, managing, financing, and marketing for the implementation.

2. In the 2nd step, leaders of the five teams, which are: 1) marketing and customer relationships team, 2) project management team, 3) policies and regulations team, 4) financing team, and 5) leaders support team for the project, should be nominated and hired in order to set the plan for each team.

3. In the 3rd step, each team must be established, and its members should be assigned.

4. In the 4th step, each team should gather the information related to its team which should include all success factors mentioned table 5.3.

5. In the 5th step, each team should gather the requirements related to its team, and that should include all related success factors mentioned table 5.3.

6. In the 6th step, each team leader has to match between the available resources and the requirements for his team in order to create a draft for his team plan.

7. In the 7th step, all team leaders should meet to review and consolidate the plans of the previous step into one master plan for the whole project. Teams' leaders as well as the project manager supposed to solve all conflicts between different perspectives based on the project strategy. Cases that require changing the strategy, teams' leaders have the option to go back to step 1 to modify the strategy as required. All success factors that are assigned to be measured before the implementation in table 5.2 should be measured and all their values should equal to one; otherwise, the whole process needs to be revised before proceeding.

8. In the 8th step, after assuring that all measured values of all success factors are equal to one, the project implementation should be started.

9. In the 9th step, periodical meetings should be conducted between all teams' leaders to review the progress of the project, and compare it to the master plan. All success factors that are assigned to be measured before and during the implementation in table 5.2 should be measured, and based on the results, the project manager must decide to go for one of the following steps. If all of the success factors values are equal to one, and the tasks are not finished yet then, go to step number 10. If at least one of the success factors values is equal to zero then, go to step number 11. If all of the success factors values are equal to one, and all tasks are finished then, go to step number 12.

10. In the 10th step, everything is as planned; the project teams can proceed in the implementation.

11. In the 11th step, the project teams needs to go back few steps to re-implement specific parts of the project.

12. In the 12th step, all tasks have been accomplished; the project should be closed as planned.

Figure 5.1 shows the flowchart of the success process framework.

5.4 Define the criteria for applying the success process

After creating the full version of the success process for e-government implementation, this general process needs to be tailored in order to be able to apply it on different e-government project. For example, if the project has no related business process, then the whole part related to BPR should be taken off from the implementation process. Although that defining this type of criteria depends on the

conditions of the project and the status of the country, the main lines for these criteria are drawn in this section, and it will be clearer in the following chapter when the case of Saudi Arabia e-government project is used as case study for the proposed framework.

The influence of the project conditions and country situation is limited in the first seven steps of the proposed framework. In each step, the one who is in charge should consider these conditions, and make the required actions. For example, in the 1st step, the status of the project should be considered in creating the strategy for the project as well as any other conditions related to the project. Also, in the 6th step, matching the requirements with the available resources should be done based in these conditions. For the rest steps, which are steps from 8 to 12, there will be no impact of these conditions on the framework.

5.5 Chapter conclusion

In this chapter, a framework for the success process of implementing e-government project has been produced. The proposed framework can be considered as the main output of this research because it is built to be able to consider all success factors mentioned in the literature of e-government implementation, and combine them in one process in order to be useful and practical. This is due to the fact that e-government implementation is a single project, and all issues related to e-government implementation from different perspectives should be considered and treated as one unit. The proposed framework is designed in three steps that are explained below.

First, measurements have been identified for the success factors extracted from the literature. It has been found that all success factors are indirectly measurable, and the time of measuring them varies between before starting the implementation and during the implementation. All success factors are assigned to two values: 1) *one* which means that all issues related to the success factor are considered, and 2) *zero* which means that not all issues related to the success factor are considered.

Implementation Stages	**Related framework's activities**

Stage# 1 Initiation	• Build the project strategy which should include:
	  o Identify the project's requirements
	  o Set the rules for solving expected conflicts
	  o Plan for supporting, managing, financing, and marketing for the implementation.
	• Create and nominate members for five teams which are
	  1. Marketing and customer relationships team (Marketing)
	  2. Project management team (PM)
	  3. Policies and regulations team (Policies)
	  4. Financing team (Finance)
	  5. Leaders support team for the project (Support)

Stage# 2 Actualization	• The five teams should be created • Each team leader should start planning for his team • Each team leader should coordinate with other team leaders to facilitate services among their teams.
Stage# 3 Implementation	• In charge person of a success factors should perform the tasks related to that success factor after coordination with the upper team(s) leader that are linked to the success factor.

Table 5.3 Match between the implementation stages as proposed by Chen et al. (2009) and the proposed framework

Second, a full version of the success process framework has been designed in order to provide a full image for what has to be done in any e-government implementation project. The success factors extracted in this research were the base

for the proposed framework which is created to be in a process format as it is shown in Figure 5.1.

Finally, guidelines for applying the proposed framework are provided in order to allow for applying it under different conditions and situations. These guidelines are used in the next chapter to apply the proposed framework on the Saudi case. As the framework for the success process is created to cover all success factors found in the literature up to current date, it is designed to be flexible for adding and modifying any number of success factors that may be needed in the future.

SF ID	Success Factor	Marketing Team	PM Team	Policies Team	Finance Team	Support Team
1	Strategic management	F	F	F	F	F
2	Political consideration	-	-	M	-	-
3	Leadership support	-	-	-	-	M
4	Project management (PM)	-	M	-	-	-
5	Financial management	-	-	-	M	-
6	Marketing	M	-	-	-	-
7	Knowledge management (KM)	-	S	S	-	-
8	Business process redesign (BPR)	-	S	S	-	S
9	Security and privacy management	S	S	S	-	S
10	Internal coordination	-	S	S	-	S
11	IT qualifications	-	S	-	-	S
12	Integration skills	-	S	S	-	S
13	Semantic heterogeneity	-	S	S	-	S
14	Beneficiary requirements	S	S	S	-	S
15	Information architecture	S	S	S	-	-
16	Beneficiaries trust	S	S	S	-	S
17	Beneficiary orientation	S	-	-	-	-
18	Beneficiary acceptance	S	S	S	-	S
19	Previous experience	S	S	S	-	-
20	Local technical capabilities	-	S	-	-	-
21	Local infrastructure	-	S	-	-	-
22	Country requirements	-	S	S	-	S
23	Cultural influence	S	S	-	-	-

Symbol	F	M	S	-
Meaning In charge person:	should follow this Success factor	Main Responsibility	Share the responsibility with others	Not responsible

Table 5.4 Relationships between E-government implementation success factors and implementation teams

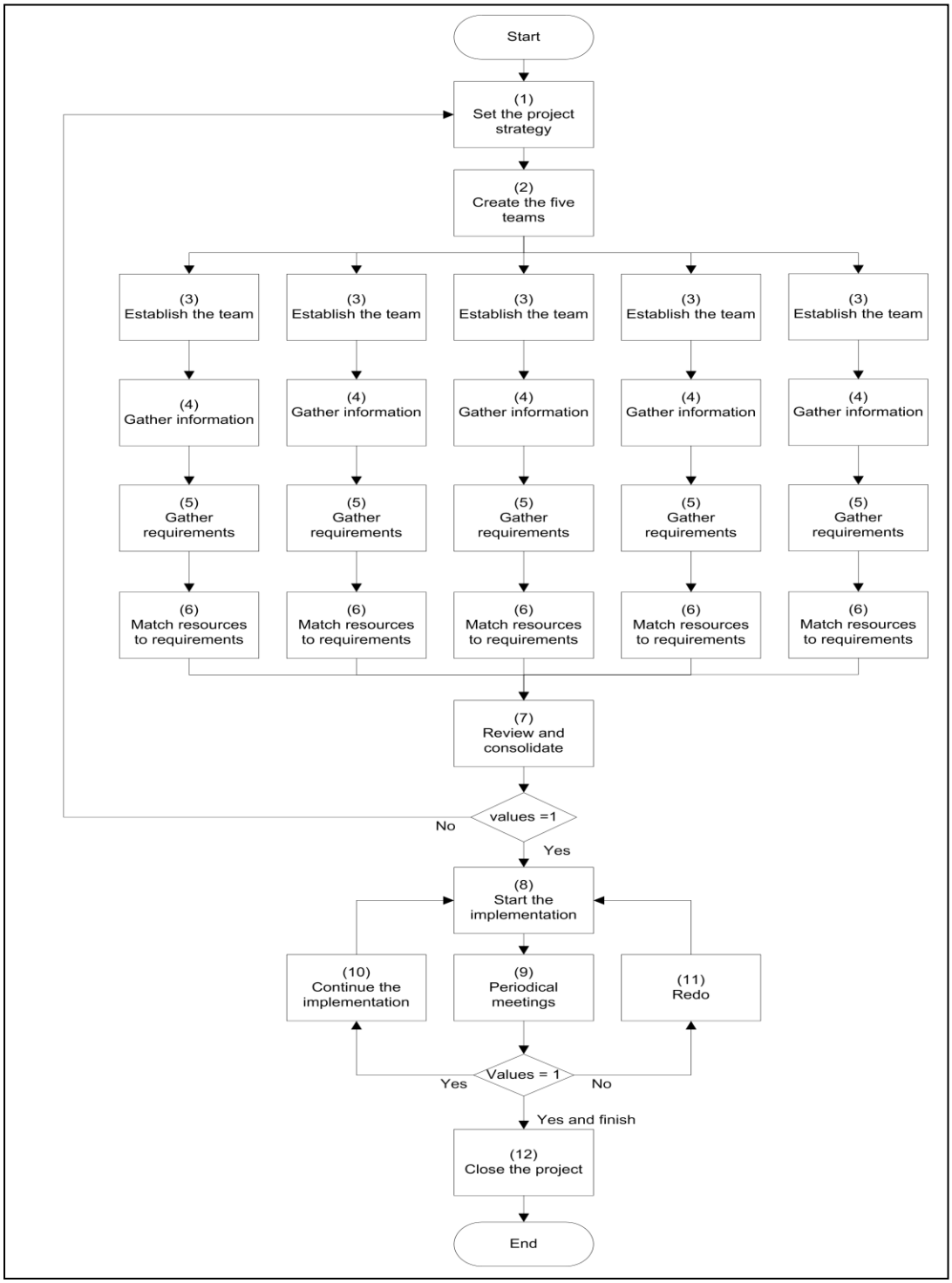

Figure 5.1 Success process for e-government implementation

CHAPTER 6: ARTIFACTS EVALUATION

6.1 Chapter Introduction

This chapter is dedicated to evaluate the two artifacts proposed in chapters four and five: 1) the e-government implementation success factors model which is a model that aggregates success factors that can affect the implementation of e-government and 2) the framework for e-government implementation success process which is a generic framework for generating the success process for e-government implementation that considers the applicable factors. As mentioned in the methodology of this dissertation in chapter three, both artifacts are evaluated separately in two different approaches using the same case study, which is the project of implementing e-government in Saudi Arabia. The case of e-government in Saudi Arabia has many characteristics that make it the chosen case for the evaluation, as it has been shown in details in chapter three of this dissertation.

Grosshans (1990) emphasized on using case studies in evaluation since 1980's, and he defined it as " a method for learning about a complex instance, based on a comprehensive understanding of the instance obtained by extensive description and analysis of that instance taken as a whole and in its context". In addition, he listed several expected benefits of using case studies in evaluation purpose in the design, data collection, analysis, and reporting stages. For example, 1) the ability to match questions asked and later generalization of findings at level appropriate to the questions, 2) assuring that important conditions and reasons will not be overlooked, and 3) assuring of the ability to collect needed data. Also, the notion of evaluating the

two artifacts separately and with different strategy is due to the nature of the artifact and due to the fact that the second artifact is built based on the first one. Therefore, there was a need for evaluating the first artifact and enhance it before designing the second one.

In this evaluation, a qualitative case study is used to evaluate the two artifacts, the model and the framework, rather than a quantitative case study, due to the complexity of the evaluation that requires person-to-person interviews to discuss any missing factors or any possible enhancements to the model and the framework. Quantitative methods would not allow this flexibility to the researcher. Although the use of the case study in this research is only for evaluation purposes, it should be in compliance with all researching validations. These validations that have been assured are: construct validity, measurement validity, internal validity, and external validity as it has been mentioned in chapter three.

Accordingly, in the following sections, the case of implementing e-government in Saudi Arabia is discussed in details. Then, the next two sections are dedicated to evaluating the two artifacts which include explaining the strategy, creating the sample, designing the questions, collecting responses, and analyzing the results. In the last section, a conclusion for both evaluations is produced.

6.2 Saudi Arabia e-government project

The Kingdom of Saudi Arabia, which is commonly known in English as Saudi Arabia, is an Arabic speaking developing country in the Middle East. It is the largest state in the Middle East in terms of land area and the second-largest in the Arab World, and it is bordered by several Arab countries. Also, it has an estimated

population of 25.7 million of which 5.5 million are non-citizens, and its size is approximately 2,149,690 km2 (830,000 sq. mi). Politically, Saudi Arabia is an absolute monarchy with a council of ministers and a consultative council, and it is considered as a stable country from political and financial perspectives.

Oil, which is the main source of the Saudi income, was discovered in Saudi Arabia by U.S. geologists in the 1930s, although large-scale production did not begin until after World War II. Oil wealth has made possible rapid economic development, which began in the 1960s and accelerated spectacularly in the 1970s, transforming the kingdom. Saudi oil reserves are the largest in the world, and Saudi Arabia is the world's leading oil producer and exporter. Oil accounts for more than 90% of the country's exports and nearly 75% of government revenues. Proven reserves are estimated to be 263 billion barrels which is about one-quarter of world oil reserves.

The Government of Saudi Arabia attaches high significance to the e-government concept and the transformation process that leads to its realization. It strongly believes in the huge benefits of such concept of e-government that entails for the national economy. Accordingly, the e-government implementation project was announced in 2004 with huge support and funding, and the whole project is called "*YESSER*" which is an Arabic word means facilitate or make it easy. Saudi government had realized that transformation to an information society cannot be achieved without comprehensive collaboration and concerted efforts to realize the set objectives. Therefore, the Ministry of Communications and Information Technology established the e-Government Program in 2005 in conjunction with the Ministry of Finance and the Communication and Information Technology Commission.

The e-government program, ‘Yesser’, has been launched with the following objectives: 1) raising the productivity of the public sector, 2) facilitating the public services to individuals and business customers, 3) increasing return on investment, and 4) providing the required information on time. Therefore, ‘Yesser’ started to plan for reducing centralization in e-government implementation and ensuring the minimum level of coordination between government departments (Abanumy et al. 2005; Saudi e-government official website).

However, and after more than seven years of announcing the program, the outcomes of the project to date are way under expectations. The above objectives are not accomplished; for example, individuals and business customers still have to visit government’s departments and agencies physically to finish their processes, thereby return on investment did not increase. Also, the integration between ministries is not activated as it should be which causes incomplete processes as an eventual result (Abanumy et al. 2005).

6.3 Evaluating the first artifact

6.3.1 Evaluation strategy

The government of Saudi Arabia has hired a team of experts in e-government implementation from all over the world as consultants for the project, and it is called “YESSER Consulting Group (YCG)”. This department takes over all works relating to YESSER consultation group, in addition to all relevant coordination works with government agencies, and performing all necessary consultation works. Therefore, it has been decided, as mentioned in chapter three, that the proposed e-government implementation success factors model is evaluated by consulting this group of experts.

Each member in the team is consulted individually about the success factors of e-government implementation and the relationships among them using a pre-prepared list of questions. Then, the whole team meets together to discuss the proposed model and refine it. This has given the team member the chance to review the model individually; then discuss it together and share the information in order to have one final evaluation for the proposed model.

6.3.2 Creating the evaluation team

Originally, the YCG consists of 16 members, and currently they are 18 members due the needs have appeared during the project. The experience and qualifications of the members vary from including the Ministers of Information and Technology in leading countries in the field of e-government to a project member in a successful e-government implementation project in different countries. However, at the evaluation time, and after coordinating with the people in charge, only eleven members of YCG have agreed to evaluate the proposed model. The positions of the eleven experts are listed in Table 6.1.

#	Position	QTY
1	Director, YESSER consulting group	1
2	Business consultant	3
3	Technical consultant	3
4	Security consultant	2
5	Operational consultant	1
6	Financial consultant	1
	Total	11

Table 6.1 Evaluation team members from YCG

In addition to the eleven experts from YCG, it has been decided that adding selective people from different positions in the same project is an added value to the evaluation. This was after getting the needed approval from the project management. For example, it has been decided to add the program's assistant director general to the evaluation team who is responsible for two departments: Infrastructure and Integration. Also, a representative from the Strategic planning and supportive initiatives department is added to the evaluation team because this department performs all works relating to strategic planning and performance measurement in addition to all relevant coordination works with other government agencies. Also, in the e-Services and center of excellence for research and development departments, two representatives have been selected as recommended by their departments' heads due to the fact that there was no one person who was fully aware of all issues related to those departments. Table 6.2 contains all added members to the evaluation team and briefs about their roles.

In fact, it should be mentioned here that there was tangible support from the management of the project to facilitate the process of the evaluation although of the work pressure that they have and their tied times. Also, the members of evaluation team were very supportive where they were spare times for the evaluation which were mostly after their working times.

#	Position	QTY	Position description
1	YESSER Program's Assistant Director General	1	Both Departments of Infrastructure and Integration are directly related Reviewing strategy of the Program's performance Participating in the process of electing strategic partners Submitting advice, guidance and directions
2	Strategic planning and	1	This department shall perform all works

	supportive initiatives Department		relating to strategic planning and performance measurement in addition to all relevant coordination works with other Government Agencies. It is also responsible for composing strategies, national initiatives studies which support in the field of e-Government.
3	e-Services Department	2	This department is responsible for supporting government agencies to implement and offer government services electronically in addition to following up improvement accomplished in this regard
4	Infrastructure Department	1	This department is responsible for supervising over infrastructure of the e-Government in addition to its development and operation Such a department includes the e-Government Data Center and Information security Unit
5	Integration Department	1	This department is in charge of supervising over the Government Service Bus (GSB) to develop, operate and maintain it
6	Center of Excellence for Research and Development	2	This department is responsible for all works relating to the Excellence Center, in addition to performing all coordination works with Government Agencies in this regard and preparing relevant studies and researches
7	Administrative Services Department	1	This department is responsible for all administrative and financial affairs relating to YESSER Program, in addition to preparing works of different committees and coordinating with various departments at the MCIT and other Agencies
-	Total	9	

Table 6.2 Evaluation team members from out of YCG

6.3.3 Building the questions

To evaluate the proposed model, there are one to one structured interviews with the selected team for the evaluation. The interviews are similar to each other, and they are composed of a list of predefined questions about the model. Through these questions, the interviewees had the chance to critique and modify the proposed model. Moreover, the questions can be classified into three categories as the proposed model is divided into three levels, and each category has several questions related to one level

of the proposed model. The approximate time for each interview is ranging from 20 to 30 minutes as it was recommended by the program director.

The first category of the questions is generic, and as the proposed model consists of three main groups, the questions in this category are mostly about the group level. Also, because this is a qualitative interview, interviewees shall be given the chance to express their opinion about the model. For instance, the first question is about the interviewee opinion in the model and its main groups, and the second question is about the possibility of adding or removing group(s) to the model. The first part of table 6.3 shows the details of interview questions in this category.

The second category of the questions list is on the subgroup level of the proposed model. In fact, there are seven subgroups in the model, and this category should consider taking the interviewees opinion in each one. The interviewees are directly asked about their suggestions for adding, modifying, or removing any of the proposed subgroups. Also they have been asked about their opinion in the relationships between the subgroups, and how to represent them. The second part of table 6.3 shows the details of interview questions in this category.

Category # 1	
Q	Question
1	What is your first impression about the proposed model?
2	Do you see any possibility for adding, modifying, or deleting any group?
3	What is your opinion regarding relationships between the groups? Do you expect overlaps between them?
Category # 2	
4	What is your opinion regarding the subgroups? Do you see any possibility for adding, modifying, or deleting any of them?
5	How do you see the way of representing the relationships between the subgroups into vertical and horizontal bars? Do you have any suggestion?
6	Can you resort or relocate the subgroups into different sequence or position?
Category # 3	
7	After reviewing the success factors for each subgroup, do you have any

	suggested modification?
8	Would you suggest another idea for representing the success factor other than listing them in a table?
9	Based on your experience in e-government implementation, do you see any missing success factor?
10	Finally, do you have any comment or suggestion?

Table 6.3 Evaluation interview question for the model

The third part of the questions list is on the success factors level of the proposed model. There are 22 success factors that have been extracted from the literature that shall be reviewed by the interviewees. First, the interviewees are inquired as we did in the previous categories about their suggestion for any modifications in the list of the success factors. Second, they are encouraged to suggest a better way for representing the success factors in the proposed model. Finally, interviewees are given the chance to generally comment on the proposed model. The third part of table 6.3 shows the details of interview questions in this category.

6.3.4 The findings

As it has been decided in the previous parts of this dissertation, the proposed model for e-government implementation success factors has been evaluated by interviewing 20 people who are in charge of the project of implementing e-government in Saudi Arabia. The interviewees are selected from different positions from the implementation team to cover different areas in technical and business perspectives. The interviewee team is selected with coordination with the top management of the project which was a very helpful factor to utilize as much as possible of the team qualifications to evaluate the model. Also, the evaluation decided to be done by one to one structured interviews consisting of ten questions that cover

the three main levels of the proposed model. In addition, a final session is decided to be held between all interviewees in order to give the chance to each one to discuss and convince the others. The goal of this session is to have one unified evaluation for the proposed model.

By taking a quick glance on the output of the interviews, we can see that the results were positive and very supportive to the proposed model. In the first category of the questions list, all interviewees have agreed that, based on their experience, the proposed model has successfully represented the reality of e-government implementation especially in the case of Saudi Arabia. Also, all interviewees have agreed on the notion of having the environmental group in the middle of the model due to its influence on other groups.

In the second category of the questions, all interviewees have agreed that there is no need for adding or modifying any subgroup of the proposed model. However, two of the interviewees have had doubts about the subgroups in the evolutional group. Moreover, three of the interviewees were not seeing the point of having two separated subgroups for the individuals and the government's employees; they believe that the two subgroups can be consolidated in one. Unfortunately, these doubts are not accompanied with clear justifications, and they are left to the final session where they will be refined and solved by all interviewees.

In the third category of the questions, the interviewees had numerous opinions regarding the success factors, and the relationships with their subgroups. Some of the interviewees have suggested combining some success factors together such as the first three factors which are: 1) strategy management, 2) political consideration, and 3) leadership support into one factor called "leadership support". They justified this by

emphasizing that these three success factors are issues related to the leadership factor as there are many issues related to project management and financial management. Also, some of the interviewees have suggested splitting the "security and privacy management" success factors into two sub-factors: "security management" and "privacy management". Others interviewees have suggested adding one success factor which is the cultural factor. The diversity of these suggestions are summarized and left to the final session to be refined and solved. Table 6.4 summarize the comments, suggestions, doubts that provided by the interviewees through the ten questions of evaluating the model.

In the final session, all interviewees have sat together and discussed the suggestions and comments mentioned in table 6.4. The interviewees agreed to keep the structure of the proposed model as is without any modification, as well as, they agreed to keep the groups and subgroups in the proposed model without any modification. Also, the team has not accepted combining the factors due to their importance, and refused splitting the security from privacy because of the inverse relationship between them. However, there was a consensus on adding one more factor to success factors list in the model which can be called as "the cultural influence", and it will be related to the environmental subgroup. Therefore, the table 4.7 which is attached to proposed model is amended accordingly, and replaced by table 6.5.

6.4 Evaluating the second artifact

6.4.1 Evaluation strategy

In order to evaluate the proposed framework for e-government implementation success process, it has been planned to find two similar tasks to be implemented in the

project of e-government implementation in Saudi Arabia, and apply the proposed framework on one of the tasks by creating an instantiation for it. This gives the researcher the chance to evaluate the impact of the proposed framework by comparing the progress and outcome of implementing the two tasks.

	Questions	Responses summary
1	What is your first impression about the proposed model?	All interviewees agree on the structure of the proposed model.
2	Do you see any possibility for adding, modifying, or deleting any group?	All interviewees do not see any possibility for adding, modifying, or deleting any group.
3	What is your opinion regarding relationships between the groups? Do you expect overlaps between them?	All interviewees agree that there will be overlaps between the groups, and that will be between the environmental group and the other groups. They all agree on putting the environmental group in the heart of the model due to its influence on the other groups.
4	What is your opinion regarding the subgroups? Do you see any possibility for adding, modifying, or deleting any of them?	Two of the interviewees suggest combining the Individual subgroup and the Government's employees subgroup into one subgroup.
5	How do you see the way of representing the relationships between the subgroups into vertical and horizontal bars? Do you have any suggestion?	All interviewees agree on the way of representing the relationships between the subgroups except three interviewees who did not understand it.
6	Can you resort or relocate the subgroups into different sequence or position?	All interviewees agree on the proposed sequence and the positions of the subgroups.
7	After reviewing the success factors for each subgroup, do you have any suggested modification?	• Combining some success factors • Splitting a success factor • Adding a success factor
8	Would you suggest another idea for representing the success factors other than listing them in a table?	No suggested idea for representing the success factors.
9	Based on your experience in e-government implementation, do you see any missing success factor?	No additional success factors other than what is mentioned in the response to question # 7.
10	Finally, do you have any comment or suggestion?	No more comments or suggestions.

Table 6.4 Summary for the evaluation interview responses

	Success Factor	Measurability	Timing
1	Strategy management	Indirect	Pre-implementation
2	Political consideration	Indirect	Pre-implementation
3	Leadership support	Indirect	Pre-implementation
4	Project management (PM)	Indirect	During-implementation
5	Financial management	Indirect	Pre-implementation
6	Marketing	Indirect	Pre-implementation
7	Knowledge management (KM)	Indirect	During-implementation
8	Business process renovation (BPR)	Indirect	Pre-implementation
9	Security and privacy management	Indirect	During-implementation
10	Internal coordination	Indirect	Pre-implementation
11	IT qualifications	Indirect	Pre-implementation
12	Integration skills	Indirect	During-implementation
13	Semantic heterogeneity	Indirect	Pre-implementation
14	Beneficiary requirements	Indirect	Pre-implementation
15	Information architecture	Indirect	During –implementation
16	Beneficiary trust	Indirect	Pre-implementation
17	Beneficiary orientation	Indirect	Pre-implementation
18	Beneficiary acceptance	Indirect	Pre-implementation
19	Previous experience	Indirect	Pre-implementation
20	Local technical capabilities	Indirect	Pre-implementation
21	Local infrastructure	Indirect	Pre-implementation
22	Country requirements	Indirect	Pre-implementation
23	Cultural influence	Indirect	Pre-implementation

Table 6.5 Revised success factors of e-government implementation measurement types

Therefore, the first step to start the evaluation is to arrange with the project management to find two similar tasks which are about to be implemented in the project, and their timeframe should be tolerable with the timeframe of the dissertation. The second step is to choose one of the two tasks to apply the proposed framework on it, and keep the team who is in charge for the other task unaware of the proposed framework. The third step is to start executing the two tasks while keeping collecting data regarding their progress. Data is obtained using a method called “Extensive or thick analysis” which is based on analyzing data from multiple sources such as interviews, observation over time, participant observation, documents, archives, and physical information. The last step is to compare the outcome of both implementations, and extract the evaluation conclusion based on investigating whether

implementation of the two tasks are in compliance with congressional intent or not. Descriptive and normative questions are used in order to explore whether the implementation has been achieved. This requires investing long time on site to get longitudinal data, having access to key people and other important sources, asking questions in details, and taking notes in organized way.

This case study can be used to assess the efficiency of applying the success process for e-government implementation generated from the proposed framework. The efficiency can be judged based on the advantages and disadvantages of using the success process in the first case compared to the situation of the other case where the proposed framework was not used, and measured by the improvements in the services provided by e-government to the beneficiaries of the project which are: individuals, organizations, society, and government.

6.4.2 Choosing the tasks

After discussions with the upper management team of the project of e-government implementation in Saudi Arabia, it has been decided to choose two tasks which were about to be implemented in the project to be used for evaluating the proposed framework. The upper management team has provided the required permissions and letters to facilitate the mission.

The chosen two tasks are too similar which helped the evaluator in eliminating some external factors from affecting the evaluation process. The two tasks are about implementing links between e-government database and the residents' police records. The police department is Saudi Arabia is divided into three completely different divisions with totally isolated management, staffs, and locations. The first division is

called “Al Amen”, and it is responsible for the security and all related issues such as crimes. The second one is called “Al Moroor” which is responsible for the traffic and all related issues such as traffic violations. The third one is called “Al Defaa” which is responsible for the safety and all related issues such as firefighting. The first task is about linking the first division database, which is the security records, with e-government database, and the second task is about linking the second division data, which is the traffic records, with e-government database. This will allow the people in charge of e-government in Saudi Arabia to match the security data with the traffic data, and link both of them to the residents profiles along with other data such as health records, and education records in order to have a complete profile for each resident in the country as it is one of the main project objectives.

After discussions with the management of e-government project, it has been decided to apply the proposed framework on the task related to the security division, and perform the other task which is related to the traffic division as it used to be done. Both tasks have the same level of complication, and employees of both divisions have almost the same level of e-government knowledge. Also, e-government implementers assigned to accomplish the two tasks have almost the same level of experience and qualifications. The only reason for choosing the first task for applying the proposed framework rather than the other one is the personal relationship between the division manager and the project manager which have given sort of flexibility in conducting interviews and exploring documents.

6.4.3 Applying the framework and building the instantiation

As it has been decided previously, the first team, who is responsible for implementing the security task, is directed to follow the proposed framework, while the other team members, who are responsible for implementing the traffic task, is directed to follow their traditional way without informing them about the new framework. Progress of both teams is monitored, reported, and analyzed through and after the three stages of the implementation which are: 1) initiation, 2) actualization, and 3) implementation, as suggested by Chen et al. (2009).

In the initiation stage, the first team's members were assigned to define the requirements of their task after arrangement with the stakeholders, set rules for solving conflicts expected between e-government success factors, and plan for creating the five teams as mentioned in the framework (see table 5.3). The output of this stage for the first team is summarized in table 6.6. On the other hand, members of the second team have defined the requirements of their task and approximately defined the five teams, but they did discuss solving the expected conflicts between the success factors. The reason for this output is that the second team's members used to use their experience in the implementation more than to follow sequential guideline instructions.

In the actualization stage, the first team was assigned to perform steps from 3 to 7 in the proposed framework after customizing them as per the task, and they became as the following:

- In the 3rd step, the five teams mentioned in the proposed framework must be established, and its members should be assigned, and because the whole team assigned to the task consists of five members, each member is thus assigned to present one team.

S	Strategies
1	The objective of this task is implementing a two way link between e-government database and the residents' police records which located in the security division in the Saudi police department.
2	The requirements of the task are: • Allow authorized e-government applications to explore the security records in the security division. • Allow the security division to notify the authorized e-government applications about new records if needed. • All implementation steps should be fed to the knowledge managements system. • New implementation is not allowed to modify any process in the police department. • The integration will be on the database level. • Current work in the department should be interrupted. • The connectivity media is ready in the site.
3	Any conflict appears during the implementation should be ruled by the followings: • The general security policies should be followed. • An intermediate file is created in e-government side to solve the differences between the two sides in semantics. • There is no expected conflict between beneficiaries due to the size of the task.

Table 6.6 Strategy for e-government task using the proposed framework

- In the 4th step, each team should gather the information related to its team which should include all success factors mentioned in table 6.7.

- In the 5th step, each team should gather the requirements related to its team, and that should include all related success factors as mentioned in table 6.8.

- In the 6th step, each team has to match between the available resources and the requirements for his team in order to create a draft for his team's plan.

- In the 7th step, all team should meet to review and consolidate the plans of the previous step into one master plan for the whole task. Teams' leaders as well as the project manager supposed to solve all conflicts between different perspectives based on the project strategy. In case of requiring changing the strategy, teams'

leaders have the option to go back to step 1 to modify the strategy as required. All success factors that assigned to be measured before the implementation in table 5.2 should be measured and all their values should equal to one; otherwise, the whole process needs to be revised before proceeding.

On the other hand, the second team has done most of the above instructions, but without the suggested order, and without the consolidation made in the 7th step. This consolidation is supposed to help in eliminating contradictions that may appear between different plans especially for success factors such as privacy, security, and semantic heterogeneity. The report of this stage, states that some of the success factors of e-government implementation are completely considered, some are considered partially, and some are ignored. Based on the proposed framework, this means that the plan made for the second team would not pass the condition in the 7th step in the proposed framework. Thereby, the framework does not recommend proceeding in implementing this task because not all values of the success factors that are assigned to be measured before the implementation in table 5.2 are equal to one. Table 6.9 summarizes this report.

In the implementation stage, the first team was directed to start the implementation as planned. Also, all team's members are directed to meet every week to review the progress, and measure the values of the success factors. In the third meeting, the team decided that the task is accomplished completely as required, and all success factors' values are equal to one. Thereby, the procedure of closing the task is processed as it is directed by the proposed framework in the 12^{th} step. Table, 6.10 summarizes the results of these meetings. On the other hand, it took from the second team more time than it was planned to achieve the task. The team members were not

meeting frequently, but only in case of emergency. Also, the members had to wait many times for each other to achieve their parts, as well as, they had to re-implement few sub tasks within their task due to gaps in their plan.

SF ID	Success Factor	Marketing Team	PM Team	Policies Team	Finance Team	Support Team
10	Internal coordination	-	v	v	-	v
11	IT qualifications	-	v	-	-	v
12	Integration skills	-	v	v	-	v
15	Information architecture	v	v	v	-	-
19	Previous experience	v	v	v	-	-
20	Local technical capabilities	-	v	-	-	-
21	Local infrastructure	-	v	-	-	-
23	Cultural influence	v	v	-	-	-

Table 6.7 Information needed to implement the first task per success factors and teams

SF ID	Success Factor	Marketing Team	PM Team	Policies Team	Finance Team	Support Team
7	Knowledge management (KM)	-	v	v	-	-
9	Security and privacy management	v	v	v	-	v
13	Semantic heterogeneity	-	v	v	-	v
14	Beneficiary requirements	v	v	v	-	v
16	Beneficiaries trust	v	v	v	-	v
17	Beneficiary orientation	v	-	-	-	-
18	Beneficiary acceptance	v	v	v	-	v
22	Country requirements	-	v	v	-	v

Table 6.8 Requirements for implementing the first task per success factors and teams

From a time perspective, it had been decided by the upper management of the project to give each team five weeks (35 days) to accomplish their task. The first team spent 3 days in the first stage, a week in the second, and three weeks in the third stage which equals to 32 days in total. However, the second team spent one day in the first stage, three days in the second, and six weeks in the third stage which equals to 46 days in total. The delay in the third stage was due the fact that the second team had to repeat few sub implementations and wait for completing some sub tasks while accomplishing the task.

6.4.4 The findings

At the end of the two tasks, both teams have been interviewed, as well as the project beneficiaries. The results of these interviewed, and the progress reports written during the implementation stages for both tasks can be summarized in the followings:

- From time perspective, using the proposed framework in e-government implementation has produced tangible improvement. By comparing the given two tasks, using the framework has decreased the task's time by 26%.

	Success Factor	**Task 1 Values**	**Task 2Value**	**Conditions of completion**
1	Strategic management	1	0	Rules for solving expected conflicts between different success factors are not set.
8	BPR	1	1	Not required in this task.
10	Internal coordination	1	0	Internal issues and constrains that are related to the project are not gathered.
11	IT qualifications	1	1	Needed IT qualifications for completing the project are gathered.
12	Integration skills	1	1	Needed integration qualifications for completing the project are gathered.
13	Semantic heterogeneity	1	0	Done on the spot without previous plan.

14	Beneficiary requirements	1	0	The requirements of all beneficiaries are gathered but not combined.
16	Beneficiary trust	1	1	Considered.
17	Beneficiary orientation	1	1	Not required in this task.
18	Beneficiary acceptance	1	0	Not considered
19	Previous experience	1	0	Not considered
20	Local technical capabilities	1	1	List all available technical capabilities, and match them with the needs (done verbally due to the task size).
21	Local infrastructure	1	1	List local infrastructure, and it with the needs (done verbally due to the task size).
22	Country requirements	1	0	Not considered
23	Cultural influence	1	0	Not considered

Table 6.9 Values of e-government success factors for the first and second tasks

- From beneficiaries' perspective, beneficiaries who dealt with the two tasks have raised the following notes: 1) e-government implementers who used the proposed framework were more organized than others, and they did not have to repeat their sub tasks, 2) the time of the implementation was really utilized which consequently saved the time of the government employees, and 3) there was no contradictions between sub tasks and teams in the task implemented using the proposed framework.

- From project management perspective, the task which used the proposed framework was very easy to be monitored and followed up in each step, as well as, its outcomes were very predictable.

- From cost perspective, although it was not possible to evaluate the impact of the proposed framework on the cost due the nature of the chosen tasks, the logistics cost of the task used the proposed framework was less than the other by 18%. This

improvement is due to the fact that using the proposed framework has minimized the number of site's visits.

Meeting	Meeting results	Action	Notes
1	Not all success factors' values are equal to 1	Proceed in the implementation	Everything is as planned and values will be equal to 1 by the end of the task
2	Not all success factors' values are equal to 1	Proceed in the implementation	Everything is as planned and values will be equal to 1 by the end of the task
3	All success factors' values are equal to 1	Close the task	All sub tasks are accomplished

Table 6.10 Frequent meetings summary during implementing the first task

6.5 Chapter conclusion

This chapter is dedicated to evaluate the two artifacts proposed in chapters four and five: 1) the e-government implementation success factors model, and 2) the framework for e-government implementation success process. Both artifacts were evaluated separately in two different qualitative approaches using the same case study, which is the project of implementing e-government in Saudi Arabia.

In the first evaluation, a group of 20 experts in the field of e-government implementation have been interviewed to assess the proposed model using a qualitative interview consists of ten questions. The findings of this evaluation shows that the interviewees agreed to keep the structure of the proposed model as is without any modification, and add one more factor to the success factors list in the model.

In the second evaluation, two actual tasks in the project of e-government implementation in Saudi Arabia have been chosen to evaluate the efficiency of the proposed framework. Using the proposed framework in e-government implementation

has shown improvement in several perspectives such as time, cost, usefulness, and project management.

In general, both evaluations have provided an evidence of the two artifacts usefulness despite the difficulties that have been confronted in the project. These difficulties are summarized as follows: 1) it was difficult to interview the employees while they had critical latency in their deliverables, 2) the government data is critical in its nature, and the researcher is usually not allowed to get in the details of government's projects, and 3) it was not easy to find two similar tasks within the project that fit the evaluation requirements and time. Despite these difficulties, the evaluation has achieved the following benefits: 1) the usefulness of the two proposed artifacts has been verified in a real case, 2) the improvement after using the proposed framework was tangible in different perspectives, and 3) this evaluation paves the road for many similar evaluations in different project.

Chapter 7: Conclusion

7.1 Chapter Introduction

Due to the unprecedented development in the field of information technology which has moved the world from the industrial age into the information age (Almarabeh and AbuAli 2010), e-government has fast become one of the main tools for governments around the world to enhance the services provided by governments and their agencies (Atallah 2001). Therefore, e-government has become a permanent commitment made by government to improve the relationship among different parties such as citizens and commercial organizations, and to reduce the cost of operating government's processes efficiently (Chen et al. 2006).

In fact, e-government projects in their nature are huge, and they require dealing with massive amount of data that imported from different resources. In addition, the beneficiaries of the project, which include the residents, government and its employees, government's agents, organizations, and society, have various requirements and expectations from e-government projects. Therefore, instead of having several frameworks guiding e-government implementation projects from different perspectives, it is necessary to have a comprehensive framework that considers all perspectives and manages to successful implementation.

In this chapter, and in order to close this research, the objective of the research and its phases are reviewed and summarized to give a quick glance on what has been achieved in this research. Then, the research's contributions and limitations are listed

in the following section. After that, generalizing the findings of the research is discussed, and finally, recommendations for future researches are given.

7.2 Revisiting research objective and phases

The objective of this research is to provide governments and e-government implementers with a comprehensive guidance that leads to successful e-government implementations. This guidance has sequential instructions that consider all e-government implementation's success factors mentioned in the literature. This research has produced two deliverables which are: 1) designing a model represents the success factors for e-government implementation as extracted from the literature, and 2) designing a framework for the success process of e--government implementation. In order to produce these deliverables the research has been discussed in several phases.

First phase was extracting e-government success factors from the literature. Twenty two success factors have extracted from the literature, in addition to one more factor that had been added to the list as decided after evaluating the model. The factors are related to different fields such as software development, systems integration, and public service. Also, it has been shown by extracting these factors that the environment of e-government implementation is complex due to variations in policies, services to be implemented, legislative and executive commitment, agency policies, and individual content providers. These complexities were examined in detail by investigating the literature, and that was the base for creating the model to represent all factors affecting e-government implementation.

Second phase was creating a model that represents the success factors for e-government implementation and the relationships among them in order to have the complete picture for the process of e-government implementation. This is an essential step for creating a framework for generating the success process for e-government implementation. The success factors have been gathered into eight subgroups, and the subgroups gathered into three groups. The proposed model represents the groups and belonging subgroups; while the success factors and their relationships with the groups and subgroups are listed in a table attached to the model. Moreover, the success factors have been classified from measurability type perspective as direct and indirect measurable factors, and from timing perspective, they have been classified into pre-implementation and during-implementation measured factors.

Third phase was designing a framework for the success process of e-government implementation which is the main output of the research. The proposed framework is built to be able to consider all success factors of e-government implementation listed in the proposed model, and the framework combined them in one process in order to be useful and practical. This was due to the fact that e-government implementation is a single project, and all issues related to e-government implementation from different perspectives should be considered and treated as one unit. The framework is created in three steps: 1) identifying measurements for the success factors extracted from the literature, 2) designing a full version of the success process framework in order to provide a full image for what should be done in any e-government implementation project, 3) providing guidelines for applying the proposed framework in order to allow for applying it under different conditions and situations.

Last phase was evaluating the two proposed artifacts which are: 1) the e-government implementation success factors model which is a model that aggregates success factors that can affect the implementation of e-government and 2) the framework for e-government implementation success process which is a generic framework for generating the success process for e-government implementation that will consider the applicable factors. Both artifacts are evaluated separately in two different approaches using the same case study, which is the project of implementing e-government in Saudi Arabia. Both evaluations have provided an evidence of the two artifacts usefulness although of some difficulties that have been confronted in the project. Generally, the evaluation have proven the followings: 1) the usefulness of the two proposed artifacts has been verified in a real case, 2) the improvement after using the proposed framework was tangible in different perspectives, and 3) this evaluation will pave the road for many similar evaluations in different projects.

7.3 Research's contributions and limitations

The contribution of the research can be summarized in the followings:

- In this research, all success factors related to e-government implementation have been collected from the literature of different perspectives.
- The gathered success factors are combined into one model that makes it easy for other researchers to study them and may add more success factors to the list.

- Combining the success factors of e-government implementation into one model gives the practitioners the opportunity to consider them in their real implementations.

- Practitioners in the field of e-government implementation may use the proposed framework as guidance in their implementations.

- Since the proposed framework is designed to accommodate additional changes, researchers may use it as starting point for their new researches regarding e-government implementation.

On the other hand, the limitations of the research can be summarized in the followings:

- The proposed model is built based on the success factors of e-government implementation extracted from the literature which means that the accuracy of the model is limited by the accuracy of the literature extraction. To overcome this limitation, the proposed model is evaluated and assessed by an expert team hired in an actual e-government implementation. Moreover, the model is designed to accept adding new success factors.

- The proposed framework is built based on the proposed model which means that the accuracy of the framework is limited by the accuracy of the model. To overcome this limitation, building the framework is delayed until the model is evaluated and verified.

- The proposed framework is designed for the current cases and conditions. Future changes in the environment that may appear in such a huge environment may not be applicable for the framework.

7.4 Generalization and future research

The main notion of generalization in this research is to identify whether the two artifacts of the research are applicable for countries other than Saudi Arabia or not. These two artifacts are: 1) designing a model represents the success factors for e-government implementation as extracted from the literature, and 2) designing a framework for the success process of e-government implementation. Also, generalizing the two artifacts is based on the framework proposed by Lee and Baskerville (2003) as mentioned in the methodology of the dissertation in chapter 3. Therefore, and because the findings with respect to evaluating the artifact are generalized based on clear characteristics of the environment. This means that the results of this evaluation can be generalized only to other environments similar to Saudi Arabia as it suggested by Chen et al. (2006) to distinguish between countries (see table 7.1). Determining the applicability of the framework to other regions is left to future researches.

Future researches may improve the results of this research in two ways: 1) investigate the new coming literature or any other sources for additional success factors that impact the projects of e-government implementation, and 2) apply the proposed framework on e-government implementations other than the case of Saudi Arabia. The proposed model is designed to be expandable for any additional success

factors, and the proposed framework is designed to be applicable to accommodate different conditions and situations.

S	Country characteristics	Saudi Arabia
1	History and culture	• Government and economy developed recently • Inconstant growing economy • Short history of democracy
2	Technical staff	• Missing the required staff • Missing resourcing capability
3	Infrastructure	• Good infrastructure Internet access to all
4	Citizens	• Having access to internet • Poor experience in using systems
5	Government officers	• No computer literacy

Table 7.1 The characteristics of Saudi Arabia

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