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**SUSTAINABILITY FRAMEWORK FOR E-GOVERNMENT  
SUCCESS: CASE OF WOREDANET SERVICES IN ETHIOPIA**

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**SUSTAINABILITY FRAMEWORK FOR E-GOVERNMENT  
SUCCESS: CASE OF WOREDANET SERVICES IN ETHIOPIA**

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This is to certify that the thesis prepared by Lemma Lessa Ferede, entitled: *Sustainability Framework for E-Government Success: Case of WoredaNet Services in Ethiopia* and submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Information Technology (with specialization in Information Systems) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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## **Abstract**

Sustainability Framework for E-Government Success: Case of WoredaNet Services in Ethiopia

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Addis Ababa University, December 2015

Sustaining successful e-government initiatives is of paramount importance for governments of developing countries because failure of the initiatives in those countries is very high and this also demonstrates that the issue has been challenging and poorly understood. Despite the high failure rate, e-government initiatives still receive huge investment and this in turn necessitates a long term benefit out of the investments. Sustainability of e-government initiatives is not treated with the seriousness it deserves. As a result, opportunities that would have been available for citizens in developing countries out of those e-government initiatives have not been well exploited. This research, thus, tries to explore the potential relationship between e-government success and sustainability in an integrated manner.

Based on a qualitative research methodology using multiple case study approach, this study focused on efforts to implement and sustain a G2G e-government initiative in Ethiopia and its subsequent challenges. Four districts (namely Lasta, Damot Gale, Sekela & Isara) were considered in two groups. The grouping is based on theoretical replication for different results whereas the cases within a group are based on literal replication for related results. Structural Model of Technology was used as an analytical tool. The data analysis revealed that differences between the two groups of districts are mainly related to a set of organizational and environmental factors.

This study has made both theoretical and practical contributions. In terms of theoretical contributions, the study proposes a conceptual framework based on the insights obtained from the empirical work. The conceptual framework aims at facilitating an understanding about success

and sustainability of e-government initiatives by uncovering the relationship between the enablers of e-government success and sustainability considering the role of IT-enabled administrative processes as a potential trajectory between the two concepts. The framework attempts to address the limitations of existing models/framework for evaluating e-government success and sustainability. It demonstrates that in order to develop a comprehensive understanding of success and sustainability of e-government projects, such an analysis must incorporate the interconnectedness of enablers of e-government success and sustainability. Through this explanation, the research contributes to debates around sustainability in the context of information systems in general and e-government in particular. From the practical perspective, this study presents an in-depth investigation of a G2G in Ethiopia. Such an exploration provides the Ethiopian government with an assessment of the performance of WoredaNet and other e-government initiatives in the country. It leads to the development of some recommendations for improving e-government in Ethiopia. Such findings are also valuable especially for other developing countries in their effort to develop e-government in their respective countries. Accordingly, the conceptual framework can serve practitioners as a quality tool to assess success and sustainability aspect of e-government initiatives. On the whole, the study provides a new perspective for understanding e-government implementation and highlights key issues which should be cautiously managed and systematically considered in order to achieve sustainability of successful e-government initiatives. Future studies attempting to deepen our understanding of success and sustainability of e-government implementations can also provide insights by extending or refining the proposed framework; conducting a quantitative research to test proposed relationships; deal with a system perspective of e-government sustainability; conducting cross-case study across nations; and making longitudinal investigation of the phenomenon among others.

**Keywords:** e-Government success, e-Government sustainability, Sustainability Framework, Administrative processes, e-Government enablers

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## **Acronyms**

AAU	Addis Ababa University
CSRP	Civil Service Reform Program
D & M	DeLone and McLean
EICTDA	Ethiopian ICT Development Agency
GUC	German University in Cairo
G2B	Government-to-Business
G2C	Government-to- Citizens
G2G	Government-to-Government
MCIT	Ministry of Communications & Information Technology
NCBP	National Capacity Building Program
OECD	Organization for Economic Cooperation and Development
PSCAP	Public Sector Capacity Building Support Program
UN	United Nations
UN-ECOSOC	Economic and Social Council (United Nations)
UNDP	United Nations Development Program

# **CHAPTER ONE: INTRODUCTION**

The purpose of this chapter is to give overall picture of the research about developing a sustainability framework for e-government success. Focusing on the research motivation, the chapter sheds light on the e-government success and sustainability problems prevailing in developing countries; highlights the urgency of the situation; points to the research gap this research focuses on; and the research questions followed by objectives of the research. The chapter ends highlighting the expected contributions and pointing the main topics of the research are discussed in detail in their respective chapters.

## **1.1 Research Motivations**

It is recognized worldwide that Information Communications Technology (ICT) is playing key role in bringing efficiency and effectiveness in different sectors such as governance, economy, social affairs, etc. and its integration is increasingly becoming a necessity as many activities may practically be impossible to handle without its use. This in turn urges countries all over the world to do their best in implementing ICTs in different sectors of their economy. In line with this, e-government is increasingly being seen as an answer to several problems that governments face in serving their public effectively (Liu, et al., 2008). E-government has received interest all over the world (Almarabeh & AbuAli, 2010) because it paves the way for a government to exercise its functions in an efficient and effective manner, hence transform its relations with citizens,

businesses or other arms of government (Ezz, 2005). This is especially so in developing countries, where the public agencies face resource constraints in improving their operations and delivering services to the citizens. In such cases, e-government has been considered as a means to save costs while at the same time improving quality, response times, and access to services; contributes a lot in improving the efficiency and effectiveness of public administration (UN-ECOSOC, 2003; Zoysa, et al., 2013). It is also seen as a tool to increase transparency in administration, reduce corruption, and increase political participation (Kumar & Best, 2006; Bhuiyan, 2011).

However, failure of information systems projects (especially in developing countries) is one of the well addressed topics in literature (Dada, 2006; Kumar & Best, 2006; Zoysa, et al., 2013). Researchers argue that most of these projects fail either totally or partially due to ‘design-actuality’ (Heeks, 2002) or ‘design-reality’ gaps (Heeks, 2003), long-term sustainability problems (Aichholzer, 2004; Pade et al., 2011), or lack of commitment on the part of political leadership and public managers (Rose & Grant 2010). Those failures become obstacles particularly on development efforts of developing countries in their effort to create long term socio-economic benefits to their citizens. If this trend continues, developing countries would face problem in transforming government services as more projects may not be made practical or not last for reasonably long period of time (Dada, 2006). The increase in failure of such e-government initiatives is also critical because the projects are consuming the governments’ large sums of money. This may be money that should have been used on solving socio-economic problems and promoting other developing efforts. On top of that, failure cases among information systems in general and e-government projects in particular are unlikely to decrease in the near future unless critical measures are taken by governments in order to address the problem.

Heeks (2003) identified that most implementations of e-government in developing countries fail, with 35% being classified as total failures (e-government was not implemented or was implemented but immediately abandoned), and 50% are partial failures (major goals are not attained and/or there were undesirable outcomes). On the other hand, in a study by Heeks & Stanforth (2007), it was estimated that over US \$3 trillion was spent on information technology (IT) projects by governments during the ten year between 2000 and 2010 with the overall estimated failure rate of 60%. This is a disturbing fact, especially as developing countries have limited resources at their disposal, and cannot afford to waste large amounts of money in such projects.

Despite the high failure rate, e-government initiatives still receive huge investment (Liu, et al., 2008) and thus their long term success is of paramount importance, especially for developing countries which are facing challenges such as limited budget, donor dependence, incomplete technology transfer, non-local agents leaving after project closure, relatively unstable political and economic environment (Hanna & Qiang 2005; Dzhusupova, et al., 2011).

The federal government of Ethiopia has initiated WoredaNet project and launched couple of e-government services with the intension to bring efficiency and effectiveness of the public service. Although the project required investment of large amount of money, the services keep functioning in some of the districts but not in others (Miruts & Asfaw, 2014:99). This implies the need to sustain the e-government services for longer period to attain what the government aspires for.

An issue equally important to the huge investment on e-government initiatives is the growing need to evaluate the e-government implementations. As governments aspire to reach positive impacts, interest has long emerged to evaluate the impact of such initiatives on public services in order to justify the costs. Indeed, evaluation of the information systems has been a popular research area over the past years, calling for appropriate evaluation measures. It has been argued by Delone & McLean (2003) that if information systems research is to make a contribution to the world of practice, well-defined measures are essential. In response to this growing need for evaluation approaches and tools, different attempts have been made so far. Accordingly, various IS evaluation models and techniques featuring different indicators have been developed and also applied to the e-government domain. However, devising mechanisms as how to evaluate and assess the successfulness of such projects is still a concern (Liu, et al., 2008).

Yet there is a gap in information systems literature regarding a mechanism that can serve as a tool to evaluate sustainability (Kumar & Best, 2006; Dzhusupova, et al, 2011). Sustainability is identified as an important but neglected topic especially in developing countries (Walsham & Sahay, 2005; Piotrowicz & Cuthbertson, 2009) and it has been, and continues to be, a central challenge (Braa et al (2004). Dzhusupova, et al (2011) reveal sustainability as well-recognized challenge in the international development community but there is little evidence of research that discusses this challenge and how it could be addressed. From these evidences, it is clear that unless sustainability of e-government initiatives is treated with the seriousness it deserves, opportunities that would have otherwise been available for citizens in developing countries may not be well exploited due to failure complications. This in the long run will make it difficult for governments in developing countries to achieve multi-dimensional benefits out of those e-government

initiatives. Therefore, we argue that it is high time to deal with the issue of e-government sustainability and explore the relationship between the two concepts: e-government success and sustainability. Hence, filling this gap in the literature is the motivation for conducting this study.

## **1.2 Statement of the Problem**

Evidences from extant literature reveal that governments around the world have faced challenges in relation to the implementation of e-Government initiatives (Leitner 2006; Gilgarcia & Pardo 2005; Dada, 2006; Belachew, 2010; Nkwe, 2012). On top of that, most of the measures to date focus on evaluating the immediate success of the e-government initiatives while sustainability (Kumar & Best, 2006; Dzhusupova et al, 2011) is an often ignored indicator of e-government success even though project stakeholders usually expect the success to last after the project is deployed.

Extant literature reveals that the two concepts (e-government success and sustainability) are related to each other and there is growing need to consider them in an integrated manner (Ikerd, 1997; Laszlo et al., 2010). For various reasons it has been difficult to materialize sustainable e-government initiatives in most cases (Pade et al., 2011; Dzhusupova et al, 2011). Over the years, many e-government projects have ended up as unsustainable implying that those projects do not deliver what the stakeholders aspire to attain at the end of the day from those investments. It is quite possible for a project to sustain without being successful; and sustainability is still important for success because unsustainability is a form of failure (Heeks, 2002). So this shows that sustainability is not the same as success but it is necessary for success (Heeks, 2005).

Laszlo et al (2010), for instance, redefines the success concept by criticizing the existing conception of success arguing that the concept has been defined in egocentric and competitive win-lose terms and is primarily measured according to standards of monetary accumulation. Such a definition is at the heart of the currently unsustainable path of human social evolution and they define success as one that embraces financial, social and environmental sustainability as the cornerstones of a holistic approach to value creation and gives rise to conditions for life-affirming dynamics of value exchange to unfold in perpetuity. Accordingly, sustainability as a concept is being highly associated with that of success (Laszlo et al., 2010). In support to this notion, Ikerd (1997) also argues that success in the new paradigm is measured against the goal of sustainable economic, ecological, social progress, rather than profits and growth and its ultimate objective is to sustain a desirable quality of life, which requires a balance of economic, social, and ecological success.

Although e-government success and sustainability are both relevant concepts to assess IT-enabled administrative processes in practice, e-government research has not yet elaborated the two concepts in an integrated fashion. Among others, what is still not explored is as how the relationship between these concepts is formed and what it consists of. Therefore, we argue that the relation of the two concepts (e-government success and sustainability) needs to be explored as they both are related to same organizational reality, i.e. IT-enabled administrative processes. This is because e-government increasingly impacts processes and workflows in the public sector and at the same time is a special case of process change enabled by information and communication technologies (Scholl, 2003). Besides, administrative processes driven by information technology (IT) are also conceptualized as a set of interconnected activities in which diverse interactions with

technology may both shape and be shaped by new forms of organizing (which has been theorized in terms of a mutual interaction between human agents and technology, the later being both structurally and socially constructed) (Orlikowski, 1992). Hence, this research tries to address the following two research questions:

1. How are e-government success and sustainability interrelated?
2. How can successful e-government initiatives be sustained?

Due to lack of clarity in conceptualization, the relationship between the two concepts is addressed by research question #1 to which the theoretical contribution of the research belongs. The second research question is driven by the idea that research is not only limited to generating new knowledge but also the knowledge shall ultimately make an impact. This is where the practical contribution of the research lies.

### **1.3 Objective of the Research**

By exploring as to how the relationship between the two concepts is formed and what it consists of, this research proposes a sustainability framework for e-government as a potential input in the effort to fill the research gap.

To address the research objective, the following main activities are performed in the course of the research.

- a. Review literature regarding e-government in context;
- b. Clarify the concepts of e-government success and sustainability;
- c. Provide a conceptualization which unfolds (for both concepts) the most used sub-concepts of e-government success and sustainability in terms of enablers and evaluation criteria;
- d. Explain the prevailing condition in the research setup;
- e. Explore the potential relationship between the variables of e-government success and sustainability;
- f. Develop a sustainability framework for e-government;
- g. Check validity of the proposed framework in another related setting.

#### **1.4 Scope of the Research**

The ICT reform is one of the key reform programs that is given due attention by Ethiopian government. In line with this, the WoredaNet project was the main project undertaken by the government mainly aimed at facilitating communication and services among different arms of the government by placing different e-government services in the platform (Belachew, 2010). Since WoredaNet is in the G2G category of e-government (Kitaw, 2006), this research only considers the e-government services put in place in the WoredaNet because of the greater attention given by the government to those services.

The study focuses on three services: Messaging, Video Conferencing, and Internet Services. These three services are among the WoredaNet services that were implemented and made operational in all woredas (districts) covered by the WoredaNet. In addition, these services are widely used ones as per the preliminary investigation by the researcher.

## **1.5 Research Approach**

The study is based on an interpretive research approach which assumes that reality is socially constructed (Walsham, 1993). Accordingly, the research questions are planned to be addressed through interpretive case studies in four districts in Ethiopia. An exploratory case study approach is adopted in order to examine the different institutional and other factors related to sustaining e-government services and explore the potential relationships between the core concepts. Such an approach allows investigating systems in particular natural institutional settings in order to understand the nature and complexity of the processes and actions involved (Walsham, 1995; Dube & Pare, 2003).

Yin (1994) states that case studies are seen as appropriate when investigators either desire or are forced by circumstances to cover contextual and complex conditions and to rely on multiple and not singular sources of evidence. The case study approach provides, at a first level, a descriptive model and can be used to identify the key factors beyond the IT system boundaries, i.e., the antecedent conditions, forces of change, forces of alignment, sequence of events and decisions, and outcomes over the course of the implementation (Montealegre, 1999). At the second level, generalizations can be made from empirical data gathered towards theoretical propositions. According to Eisenhardt (1989) case studies can also be used to generate theory and such a theory-building from case study research is particularly appropriate when there is little known about a phenomenon or there is not enough literature to engage an incremental theory building.

Figure 4.1 in chapter four summarizes the way how this research is designed starting from the main research questions all the way to the proposed sustainability framework which is the final deliverable of this research. Accordingly, research questions are forwarded at the beginning based on the research problem. Then, comprehensive literature review is conducted to show that there exists a gap in theory to explain the e-government success and sustainability phenomenon in the ground in an integrated manner. Following the literature review, a theoretical research framework is selected and case study questions were set to guide the data collection and analysis. Before the actual data collection, issues such as determining type of case study, identifying the research variables to be observed, selecting cases (districts), identifying study subjects, and designing data collection protocol based on the identified variables were conducted. Next, the case study is conducted, the collected data is analyzed, and the findings discussed. Finally, a sustainability framework for e-government success is developed, its feasibility checked in another related setting, and the components of the framework presented.

## **1.6 Organization of the Dissertation**

The purpose of this introductory chapter was to give the overall picture of the research about developing sustainability framework for e-government success. Focusing on the research motivation, the chapter shed light on the e-government success and sustainability problems prevailing in developing countries and highlights on urgency of the situation. The research questions and objective of the research were also presented.

The next chapter makes an extensive discussion on e-government evaluation and related matters in organizations; an overview on the IT/IS integration in organization, and on theories used in IS research so far. The chapter also reviews extant literature on the relationship between e-government and Business Process Change in organization based on e-government and Business Process Management (BPM) literature.

The purpose of chapter three is to review related literature in order to identify the concepts that explain e-government success and sustainability both from enabling factors and evaluation dimensions. Then it summarizes the state-of-the-art in e-government evaluation showing the research gap.

Chapter four deals with the detailed research design and methodology. It provides the blueprint as how to link the data collected and the conclusions drawn to the initial research questions of the study. It begins presenting the philosophical underpinning of this research, and gives detailed account on the research strategy and subsequent techniques adopted together with justifications for doing so. Finally, details on different issues in relation to the case study research design are discussed together with the procedure followed in order to check validity of the framework.

The Case Study chapter, chapter five, describes the research environment investigated. It begins by giving an overview on the socio-historical, economic, and political context. This is followed by a brief overview on WoredaNet and its services. Then it details with the process of research activity in the field. Finally, results and discussion of the findings are presented.

The proposed sustainability framework for e-government success is presented in chapter six, followed by the theoretical and practical contributions of the research in last chapter, chapter seven. This last chapter also pinpoints limitations of the research and proposes a research agenda for future research.

# **CHAPTER TWO: EVALUATING E-GOVERNMENT IN AN ORGANIZATIONAL CONTEXT**

This chapter discusses the relationship between organizational context and information systems in general and e-government in particular. It starts by giving an overview on the evaluation of information technology in organizational context. In line with this, a detailed discussion on the theory used in the current research. The chapter also reviews extant literature on the relationship between e-government and business process change in organizations based on e-government and Business Process Management (BPM) literature. Finally, it gives due account to the challenges of e-government adoption in developing countries.

## **2.1 Evaluating Information Technology (IT) in Organizational Context**

Information technology is playing a crucial role in every walks of life. In organizations, it is not only playing a supporting role in meeting organizational goals, but also shaping the way organizations perform. Such role of the technology changes from time to time since technologies and organizations undergo dramatic changes in form and function (Orlikowski, 2000). In line with this, Petter et al. (2012) pointed that couple of changes occurred through time on issues such as the role of information systems in organizations, key stakeholders, expected benefits of the investments in information systems, the perception and measures in the evaluation of information systems.

Orlikowski & Robey (1991) consider the development and deployment of information technology in organizations as a social phenomenon where the organizational consequences of technology are products of both material and social dimensions. They have suggested that information technology has both social and material properties: being physically and socially constructed by subjective human action, while also objectified and made concrete through institutionalization. As people in organizations interact with technology in their ongoing practices, they enact structures which shape their emergent and situated use of that technology. They view the use of technology as a process of enactment which in turn enables a deeper understanding of the constitutive. This in turn implies that in order to understand information technologies in organizations and role of social practices in the ongoing use as well as change of technologies in the workplace, it is necessary to analyze not only the technological artifacts, but also the organizational and social aspects around those artifacts.

### **2.1.1 Information Systems (IS) in Organizations**

The added value that advances in technology have brought about in the field of business encouraged more focus on the development of computer technology, its complex use, and variety of application in organizations (Davis, 1989). There have been two fundamental forces driving the formation of a new organization function and the new technology-enabled systems in organizations. One is the availability of powerful computer and communications technology; the other is the desire of organizations to use the capabilities in organization work. The result has been revolutionary as new capabilities and new affordances have been applied to the activities of organizations (Davis, 2006).

According to Benbasat & Zumud (2003), IS scholars and IS practitioners strive to increase their collective understandings of: (1) how IT artifacts are conceived, constructed, and implemented; (2) how IT artifacts are used, supported, and evolved; and (3) how IT artifacts impact (and are impacted by) the contexts in which they are embedded. In other words, according to Benbasat and Zumud (2003), such precise description of focus in IS revolves around the following two major areas:

- A. The human behaviors reflected within, and induced through both the: (1) planning, designing, constructing, and implementing; and (2) direct and indirect usage of these artifacts.
- B. The managerial, methodological, and operational practices for directing and facilitating IT artifact usage and evolution. As a consequence of use, the impacts (direct and indirect, intended and unintended) of these artifacts on the humans who directly (and indirectly) interact with them, structures and contexts within which they are embedded, and associated collectives (groups, work units, organizations). Instead, our focus should be on how to best design IT artifacts and IS systems to increase their compatibility, usefulness, and ease of use or on how to best manage and support IT or IT-enabled business initiatives.

In organizations, the term Information System (IS) or some equivalent label refers to both the systems that deliver information and communication services to an organization and the organization function that plans, develops, operates, and manages the information systems (Davis, 2006). In an organization of any size, there is a function responsible for the technology, activities and personnel to support its technology-enabled work systems and the information and communication needs of the organization. There is also an academic discipline that teaches those

who build, acquire, operate and maintain the systems and those who use the systems. Both the organization function and the academic discipline have developed over a period of 55 years (but primarily in the last 40 years) (Davis, 2006).

As a discipline, IS differs from other computing disciplines in that it examines more than just the technological system, or just the social system, or even the two side by side; in addition it investigates the phenomena that emerge when the two interact (Lee, 2001). This implies that IS neither merely focuses on technology or the human aspect of organizational systems instead its focus lies at the intersection between the two as what happens when technology and humans interact.

### **2.1.2 Theories used in IS Research**

Information systems is a relatively new discipline with many researchers having their foundation studies in other disciplines. The IS discipline is moving towards some sense of its own identity and some agreement on what constitutes suitable foci of research (Avison, et al., 2008).

The IS discipline is characterized as multidisciplinary and pluralistic in its approaches (Sawyer & Huang, 2007). It has drawn from many other disciplines to address issues that reflect the centrality of IT in varied socio-economic contexts. The comprehensive nature of the IS field has not only enabled it to borrow theories and models from other disciplines, but it adapted them to better suit IT-embedded phenomena, thereby building a sizeable portfolio of adapted theories, models, and concepts (Avison, et al., 2008).

Based on a review of articles in an Information systems Journal, Avison et al. (2008), for instance, identified 50 theories and theoretical constructs (Table 2.1) that are used by authors over the period 1991–2008 (17 years). In their analysis, they have found that many, but not all, of these theories have been developed in other disciplines, and at the same time they found no valid reason that can substantiate the argument IS should not benefit from other disciplines.

**Table 2.1** Theories and theoretical constructs (*Source: Avison et al., 2008: p. 13*)

Actor Network Theory	McDonaldization theory
Agency Theory	Metaphors
Appreciative inquiry	Narrative thinking
Bargaining theory	Nolan's stage theory
Behavioral decision theory	Norm-based agency
Chaos theory	Organizational learning
Capability maturity model	Organization theory
Contingency theory	Personal construct theory
Critical thinking	Popperian philosophy of science
Critical social theory	Pragmatics
Economic theory	Quinean philosophy of science
Ethical theory	Resource-based theory
Feminine theory	Sense making
Game theory	Social action
Giddens' structuration theory	Social presence theory
Habermas's communicative theory	Socio-technical theory
Hackman's model of group effectiveness	Speech act theory
Human cognition	Stages of growth model
Information theory	Stakeholder theory
Innovation diffusion	Systems theory
Institutional theory	Theories of discourse comprehension
Kohiberg's theory of moral development	Theories of meaning
Lewin's change theory	Theories on motivation and training
Logico-linguistic model	Theory of planned behavior
Masculine theory	Upper echelon theory

As opposed to the prevailing view that IS discipline has “reference disciplines” where the theories and methods of the reference disciplines serve to set the standards by which the quality and maturity of IS research should be measured, Baskerville & Myers (2002) offered a new opinion that the IS discipline is no longer just emerging, but has fully emerged as a discipline in its own right and they argue that IS can now serve as a reference discipline for others, even for those fields that previously served as reference discipline for IS.

Similarly, e-government is relatively new research domain in which researchers adopt theories and frameworks from the broader IS discipline and even other “reference disciplines”. In relation to this, Heeks and Standforth (2007) pointed that e-government researchers have already begun to investigate; typically making use of frameworks from the information systems (IS) literature. Some have adopted a factorial approach related to sets of variables/critical success factors identified in IS projects; whereas others have made use of conceptual models applied in Information System. Structuration theory is used as analytic tool in this research because of its capability to explain both organizational formation and technological formation side by side. Accordingly, section 2.1.3 further reviews extant literature on the relevance of structuration theory for IS research.

### **2.1.3 Review of Selected Organizational Theories used in IS Research**

Organizations are at the center of any societal activity. They are complex social innovations developed by people to meet different societal goals. Being part of the dynamic environment, organizations need to be continually redesigned and transformed in order to respond to changes in the environment. They may or may not meet their goal due to several reasons. It is therefore

important to know the enabling and/or challenging factors as well as the potential relationships among those factors in order to find out remedies. To that end, different organizational theories are developed by scholars in order to assist the effort to study different organizational phenomena. Institutional Theory, Actor-Network Theory, and Structuration Theory are popular among those theories and are selected for brief review in this section.

### **2.1.3.1 Institutional Theory**

Various researchers have employed institutional theory in a variety of disciplines such as in social science (economics, sociology and political science) and organizational studies (Kimaro, 2006). The concepts of institution and institutionalization have been defined in diverse ways, with substantial variation among approaches (Scott, 1987). Thus, the beginning of wisdom in approaching institutional theory is to recognize at the outset that there is not one but several variants (Scott, 1987; Bjorck, 2004).

Najeeb (2014) also pointed that the study of institutions traverses the academic fields of economics, sociology, political science and organizational theory. An underlying assumption in the study of institutions is that organizations are deeply embedded in the wider institutional context (DiMaggio & Powell, 1983). The theory is credited with its emphasis on the contextual and historical aspects in which organizational actions take place (Najeeb, 2014). It is a useful lens to analyze organizational behavior because it can respond to empirical mismatch, where, ‘what we observe in the world is inconsistent with the ways in which contemporary theories ask us to talk’ (Najeeb, 2014). Besides, organizational practices are either a direct reflection of, or response to, rules and structures built into their larger environment (Scott, 1987).

In IS, it has been applied by various scholars, for example, to study how institutions influence the design, use and impact of ICTs in organizations (Kimaro, 2006) and the suitability of an institutional perspective in IS/IT security research (Bjorck, 2004). Orlikowski & Barley (2001) also argue that institutional analysis can be used to examine how broad social and historical forces, ranging from explicit laws to explicit cultural understandings, affect and are affected by the actions of organizations.

### **2.1.3.2 Actor-Network Theory (ANT)**

ANT is a theoretical framework used in social studies of technology to explain the way technological artifacts are constructed in society (Elgali & Kalman, 2010). Under this framework, the actors (both human and non-human entities) are identified, and networks in which they are embedded are explored, in order to identify ways in which social context is bound up with the different actors (Zoysa & Letch, 2013). One of the significant advantages of ANT in relation to alternative approaches to understanding technology-rich programs is that it treats both people and technological artifacts symmetrically and thus can expose relationships and contexts which are more difficult to detect using other approaches (Tatnall & Gilding, 1999).

Researchers have long recognized the potential of employing ANT to investigate the successes and failures of technological innovations (Naidoo, 2008). For instance, Elgali & Kalman (2010) in their study applied actor-network theory (ANT) to understand the construction of the concept of failure in the national ICT integration program. They claimed that unlike the extensive literature that explores this failure through the lens of disciplines such as educational management,

philosophy of education, or management, ANT allowed them to study issues related to information systems in the context of social constructivism (Elgali & Kalman, 2010). Similarly, Zoysa & Letch (2013) applied ANT to explore the sustainability of ICT4D projects via a case study of a large-scale, nation-wide, government sector ICT4D project that targets agricultural development in a developing nation in South Asia.

Although ANT is a better possibility to understand technology in the social context, it is also exposed to some critiques and limitations. ANT is criticized for its disregard of social structures; its disregard for moral and political analysis; its symmetrical treatment of humans and non-humans; and its descriptive power as opposed to power to explain, together with the problem of managing vast amounts of detail (Naidoo, 2008). Another criticism on ANT stems from its assumption of according symmetry between the social and the technological in the actor-network and the main critique is that people have been reduced to the same level as things and machines. A number of critics argue that treating all actors as equal is problematic: not all actors are equal; some exert a stronger influence than others (Naidoo, 2008; Zoysa & Letch, 2013).

### **2.1.3.3 Structuration Theory**

Structuration theory was developed by Giddens (has been available since 1984) as a way to explain the duality of structures and agents (Rose & Scheepers, 2001). Giddens attempt was to build on existing theory that either relied too much on structures of society, thus making the human agents inert and passive actors, or on human action originating in interpretive theories that tended to ignore social conditions, power, and constraints that shaped human action (Jones & Karsten, 2008).

Structure and agency are at the center of the enquiry of the theory. Giddens recasts the two independent sets of phenomena of structure and agency as a 'duality' - two concepts which are dependent upon each other and recursively related. He emphasizes that social structures do not exist independent of human action, nor are they material entities (Orlikowski, 1992). Accordingly, knowledgeable actions of human agents discursively and recursively forms the sets of rules, practices and routines which, over time and space constitutes structure in a process of 'structuration'. Structuration is the process whereby the duality of structure evolves and is reproduced over time space. Agents in their actions constantly produce and reproduce and develop the social structures which both constrain and enable them (Pozzebon & Pinsonneault, 2001).

“Structure” has a non-traditional definition within the theoretical framework of structuration. Structure is traditionally seen as the formal and informal links of organizational activities and elements. However, viewed through the structuration theory lens, structures are codes of behavior, abstract rules, indications, judgments, or ways of doing, seeing or understanding that operate through language, implicit stores of knowledge that exist in workers' heads and explicit orders, that steer individual and collective organizational action (Lewis & Suchan, 2003; De', 2008). Structures are either reinforced or modified, sometimes radically but more often than not incrementally, by individual actions and, in general, by the flow of ongoing organizational behavior. In doing so, people's actions reproduce structures and, simultaneously, are guided by them (Lewis & Suchan, 2003). Structures are neither permanent nor absolute and they are created through discourse and practice, reinforced through those, or changed (De', 2008).

The structures are often understood as corresponding to three dimensions: signification, domination, and legitimation. Structures of signification provide meaning to everyday actions and the objects humans interact with. Domination structures are power relations that are implicit in everyday language and human action. Structures of legitimation determine what is appropriate or acceptable, without the use of power. Use of e-mail, for example, within organizations gains legitimacy as an appropriate mode of communication through structures of legitimation arising from acceptance and interaction (De', 2008).

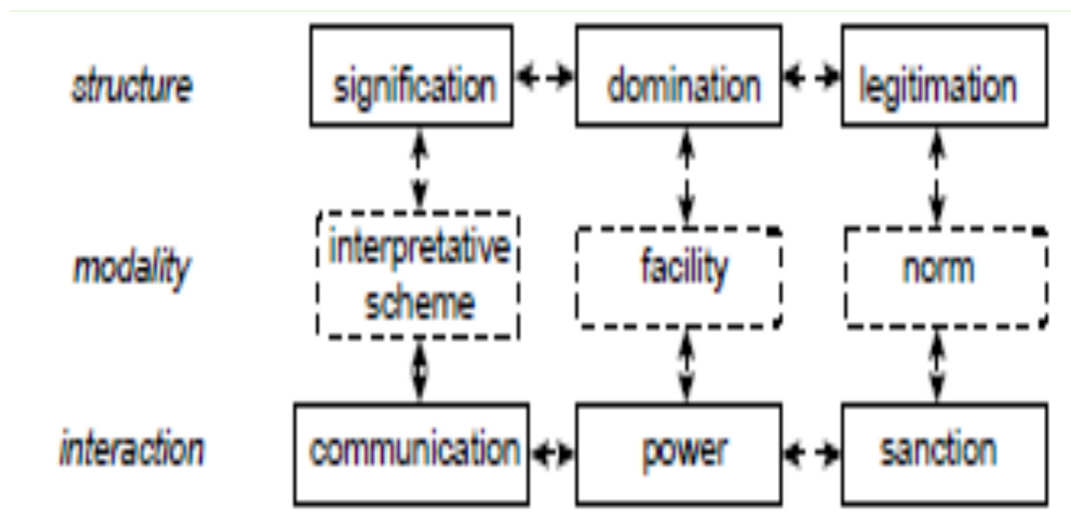


Figure 2.1: Dimensions of the duality of structure (Source: Rose & Scheepers, 2001)

The three structures identified by Giddens are linked to human action through three linking modalities (Rose & Scheepers, 2001; Pozzebon & Pinsonneault, 2001). Accordingly, as human actors communicate, they draw on interpretative schemes to help make sense of interactions; at the same time those interactions reproduce and modify those interpretative schemes which are embedded in social structure as meaning or signification. Similarly the facility to allocate resources is enacted in the wielding of power, and produces and reproduces social structures of domination,

and moral codes (norms) help determine what can be sanctioned in human interaction, which iteratively produce structures of legitimation.

Giddens' structuration theory has been adopted and adapted by a number of researchers in the Information System field (Rose & Scheepers, 2001). Specific to studying technology in organizations, the theory serves as a useful theoretical framework that can help understand the relationship between technologies, the people who interpret them, and the patterns of use that stem from that interpretation (Lewis & Suchan, 2003; Akgün et al, 2007).

Orlikowski & Robey (1991) (in De', 2008) found the following four important interactional influences of IT within organizations which can be considered as important points that strengthen the appropriateness and relevance of structuration theory in the effort to understand the issues that pertain to the use and management of information technology in organizations.

1. Information technology is shaped by humans within the organization.
2. Information technology both facilitates and constrains human action. It thus becomes a part of the schemes, facilities and norms that determine the structures in the organization.
3. Design standards, codes, and norms embedded in the technology influence human interaction with the technology.
4. Information technology mediated interaction affects the structures existing in any organization.

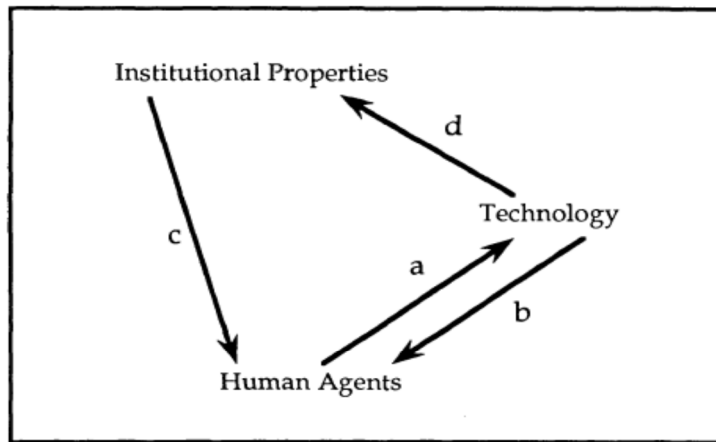
As De' (2008) argues these issues arise in a dynamic and reinforcing manner and when examined explicitly they give rise to a rich set of issues regarding the complex interactions of technology and people within organizations.

Previous studies in the relationship between technology and organizations assumed technology to be an objective, external force that would have deterministic impacts on organizational properties such as structures. Still others studies focused on the human aspect of technology, seeing it as the outcome of social action. Taking structuration theory as a spring-board, Orlikowski criticizes those two opposing views by arguing that they are partially correct but one-sided. Rather, she underlines the importance of taking both perspectives in to account in order to study technology and organizational structural formation in a balanced manner (Orlikowski, 1992).

Giddens' Structuration theory has long been used by Information Systems researchers (Rose & Scheepers, 2001; De', 2008) as a way of deepening understanding regarding the mutual interaction between social structure and the agency in terms of human interaction in organizations. However, Orlikowski (1992) argues that Giddens does not address the issue of technology in his structuration paradigm. Hence, she proposed a 'Structurational Model of Technology' to better reconceptualize the notion of technology, and to reformulate the relationship between technology and organizations.

In her 'Structurational model of Technology', Orlikowski (1992) framed the role of technology in terms of a mutual interaction between human agents and technology, and hence she considers technology as both structural and socially constructed. Her model mainly considers technology as

a product and a medium of human action that is enabled or constrained by institutional conditions and results in institutional consequences. Accordingly, the diverse interactions with technology may both shape and be shaped by new forms of organizing. See Figure 2.1 for details on type of influence and nature of influence of the four relationships in the model. Arrow *a* in the figure depicts technology as a product of human action; arrow *b* depicts technology as a medium of human action; arrow *c* depicts institutional conditions of interaction with technology; and finally arrow *d* represents institutional consequences of interaction with technology.



ARROW	TYPE OF INFLUENCE	NATURE OF INFLUENCE
a	Technology as a Product of Human Action	Technology is an outcome of such human action as design, development, appropriation, and modification
b	Technology as a Medium of Human Action	Technology facilitates and constrains human action through the provision of interpretive schemes, facilities, and norms
c	Institutional Conditions of Interaction with Technology	Institutional Properties influence humans in their interaction with technology, for example, intentions, professional norms, state of the art in materials and knowledge, design standards, and available resources (time, money, skills)
d	Institutional Consequences of Interaction with Technology	Interaction with technology influences the institutional properties of an organization, through reinforcing or transforming structures of signification, domination, and legitimation

Figure 2.2: Structural Model of Technology (Source: Orlikowski, 1992)

In general, structuration theory has found wide application amongst MIS researchers. The use of the theory ranged from using a few aspects of it to a deep critical analysis and extension of its aspects. Some researchers use the theory to justify and legitimize their own theoretical stance than to contribute to the entire theory (Jones & Karsten, 2008).

This sub-section showed how IT is associated to a given organizational context and how important it is to examine the technology in light of its context. This is because humans design, develop, and implement technology for a given purpose and then use the technology to perform their tasks. At the same time, their degree of use of the technology is enforced or hindered by organizational structural properties and the continued use of the technology ultimately impacts organizational formation.

## **2.2 E-government**

This section presents basics on e-government focusing on the different views (definitions or conceptualizations) of the concept followed by brief account on e-government stakeholders and its common services.

### **2.2.1 Definitions**

E-government is short form for electronic government, and it is also referred to as digital government, online government and even transformational government (Al-Busaidy et al, 2009). The term e-government (e-Gov) emerged in the late 1990s and as a field it is gradually maturing (Grönlund & Anderson, 2006), but the history of computing in government organizations can be

traced back to the beginnings of computer history (Grönlund & Horan, 2004). Just like the term e-Commerce, the term e-government was born out of the Internet boom. However, it is not limited to Internet use or publicly accessible systems for direct use by customers or citizens (Heeks, 2006).

There are many definitions of e-government, and no standard and universally accepted definition of the concept until today (Harfouche and Kalika, 2009; Alhujran, 2009). Some researchers and practitioners view e-government merely as the use of ICT to provide government information and services to the public and there are others who not only emphasize the use of the technology, but also highlight the purpose for such technology (World Bank, 2011).

E-government is defined as the use of ICT to promote more efficient and effective government (Hafkin, 2009); the use of ICT to facilitate the accessibility of government services (Gorla, 2008; Chatfield, 2009; Chen, 2009); the use of ICT to make governments more accountable to citizens (Gorla, 2008); the use of ICT to allow greater public access to information (Muir & Oppenheim, 2002); the use of ICT to deliver improved services to citizens, businesses, and other members of the society through changing the way governments manage information (Jaeger, 2003; Kumar et al., 2007). A bit broader, it is also defined as the use of ICT to promote more efficient and effective government, facilitate the accessibility of government services, allow greater public access to information, and make governments more accountable to citizens (Kitaw, 2006). More important, it aims to help strengthen government's drive toward effective governance and increased transparency to better manage a country's social and economic resources for development (Basu, 2004; Uppstrom, E. & Lonn, C. (2014)).

The World Bank (2011)<sup>1</sup> provided a comprehensive definition of e-government as the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government for better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. Less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions are among the benefits.

From the aforementioned definitions, it seems that it is one of those concepts that mean a lot of different things to a lot of different groups (Harfouche and Kalika, 2009). Despite the diversity of e-government definitions found in the literature, the usage of ICTs for public service delivery is central concept that underlies all definitions (Alhujran, 2009).

E-Government development is not only about implementing a new IT system but also aims to improve public service delivery, improve access to information and services and increase government transparency and accountability (Lam, 2005; Tung & Rieck, 2005). It has the potential to enhance the relationship between the government and its citizens by facilitating easier, smoother, and more efficient interactions between citizens and government agencies (Lee et al, 2005). It is aimed at improving public services and delivering them efficiently and conveniently

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<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/EXTEGOVERNMENT/0,,contentMDK:20507153~menuPK:6226295~pagePK:210058~piPK:210062~theSitePK:702586~isCURL:Y,00.html>

to customers; and experience shows that e-government can improve transparency and thus reduce corruption and poverty (Schware & Deane, 2003).

### **2.2.2 Stakeholders**

A stakeholder in a project is any group or individual who can affect or being affected by the intended outcome of the project. For a project to succeed, a stakeholder analysis is required in order to understand the level of influence and interest of each stakeholder. This in turn helps to properly manage the communication with the stakeholders with a view to lead the project to success. Relating this view to e-government projects, there is an increasing recognition for stakeholders' participation, and the various stakeholder groups for e-government have a significant role to play in ensuring the long-term success of e-government (Rowley, 2011; Scholl, 2001).

Any project (by its definition) is unique. Accordingly, each e-government project is different, has different stakeholders and stakeholder roles, and those stakeholders have different interests and seek different benefits (Rowley, 2011). Chircu (2008) (in Rowley, 2011) noted that e-government projects are characterized by many stakeholders with multiple value dimensions (such as financial, social and political). There is an increasing recognition that various stakeholder groups for e-government have a significant role to play in ensuring the long-term success of e-government; and successful e-government requires the engagement of all stakeholders, and thus a shared understanding of the interests, perspectives, value dimensions, and benefits sought from e-government by the various stakeholder roles (Rowley, 2011). In relation to this, Heeks (2006) points that an e-government project must provide each stakeholder with at least some positive answer to the key change management questions they raise. This is mainly because it is related

with the politics and self-interest that are the strongest determinants of e-government success or failure.

Although there is growing recognition of the need to consider stakeholder perspectives in e-government, research to date has followed different ways of stakeholder categorization. Some adopt general categorizations (often to be found in national and international policy documents) and others follow more specific categorizations, typically relating to a specific project or initiative or focus on the interests of one or two key stakeholder groups (Rowley, 2011). Based on review of extant literature, (Rowley, 2011) generated a comprehensive list of all potential stakeholder roles based on the prevailing segmentation of e-government stakeholders by other authors (Table 2.2).

Table 2.2: E-government stakeholder roles (*Rowley, 2011*)

<b>Stakeholder Roles</b>
People as service users
People as citizens
Businesses
Small-to-medium sized enterprises
Public administrators (employees)
Other government agencies
Non-profit organizations
Politicians
E-government project managers
Design and IT developers
Suppliers and partners
Researchers and evaluators

In general, different stakeholders have different interest, role, and impact on e-government and it is thus important to consider their level of impact during implementation as well as operation of the e-government. Some stakeholders have high power and interest whereas others not. So, identification of the power and interests of stakeholders helps in gaining understanding and building consensus; communicating the benefits of a proposed project; and building strong, inclusive campaigns that involve the public.

### **2.2.3 Services**

The target of e-government encompasses four main groups: citizens, businesses, governments (other governments and public agencies) and employees. The electronic transactions and interactions between government and each of these four groups (citizens, businesses, governments and employees) constitute the e-government web of relationships and the respective four main blocks of e-government services, that are: Government to Citizens (G2C), Government to Business (G2B), Government to Government (G2G) and Government to Employees (G2E) (Ndou, 2004). Ndou (2004) characterizes each of these e-government services as follows:

1. *Government to Citizen*: deals with the relationship between government and citizens. E-government allows government agencies to talk, listen, relate and continuously communicate with its citizens, supporting, in this way, accountability, democracy and improvements to public services.
2. *Government to Business*: consists of the electronic interactions between government agencies and private businesses.

3. *Government to Government*: refers to the relationship between governmental organizations, as for example national, regional and local governmental organizations, or with other foreign government organizations.
4. *Government to Employees*: refers to the relationship between government and its employees.

In line with this, Kitaw (2006) identified examples of different e-government delivery models among which are Government-to-Citizen (G2C) (eg. Rwanda Online Government Services and Mauritius Government Online Centre); Government-to-Business (G2B) (eg. Contribution Network Project of Mauritius); and Government-to-Government (G2G) (eg. WoredaNet of Ethiopia).

This sub-section presented different conceptions on e-government. Although there exist differences in the way scholars define e-government, its capability to improve and more importantly transform the public sector (especially in developing countries) is common.

### **2.3 E-government and Business Process Change**

E-government cannot be successfully implemented without changes in business processes that are performed inside governmental institutions (Indihar & Jaklič, 2007). It should not be treated only as computerization of the traditional public services. Rather it requires paradigm shift in that it requires changing how officials think and act, how they view their jobs, how they share information between departments (G2G), with businesses (G2B) and with citizens (G2C). E-government should be treated as a reform process. It requires re-engineering the government's

business processes, both within individual agencies and across government. This in turn implies that e-government has to be considered as part of a larger government modernization program (The Working Group on E-government in the Developing World, 2002). Hence, in this section brief discussion is made on Business Process Reengineering, change management and their implication and/or relationship with e-government initiatives.

### **2.3.1 Business Process Reengineering in the Public Sector**

Business Process Reengineering (BPR) involves the fundamental rethinking and radical redesign of business processes in order to achieve dramatic improvements in critical measures of performance such as cost, quality, service and speed. It aims at improvements by increasing efficiency and effectiveness of processes (Indihar & Jaklič, 2007).

Although the literature on business process change is rich and mostly dated within the 1990s, majority of those studies concerned the application of changes on business processes of the private sector (Ndou, 2004; Indihar & Jaklič, 2007). In recent years, however, BPR is widely being used in the public sector (Pateli & Philippidou, 2011). As a result, citizens are being treated as stakeholders (Ndou, 2004), governments' accountability on the process outcomes increased, and intergovernmental and public-private partnerships is being created (Pateli & Philippidou, 2011).

The great majority of early e-government projects focused on redesigning a single governmental institution's services and information delivery, and thus generated internal efficiencies. The latest developments in e-government, on the other hand, have shown that there is value to be created

through integration of services across the boundaries of departments and governmental agencies (Pateli & Philippidou, 2011).

Since e-government is about rethinking government processes and incorporating beneficiaries within the design and execution of these business processes, Grönlund (2010) relates e-government with organizational change. It denotes a structural and process-oriented change of governmental organizations, with the objective of getting them to run more efficiently (Pateli and Philippidou, 2011). Accordingly, it is found to be a main driver of business process change in the public sector (Scholl, 2007) and it has an increasing influence on how government business processes evolve and change. With the increase in scope and scale of e-government projects, existing business processes including core processes become candidates for improvement and change (Scholl, 2004).

E-government is also considered a socio-technical system that emphasizes the continuous and two-way interaction of the technology and the organizational-institutional environment. It enables and is affected by organizational business process change. In this regard, Scholl (2003) points that e-government increasingly impacts business processes and workflows in the public sector and must be seen as a special case of ICT-enabled business process change. Hence, the question of process change needs to be handled carefully if e-government projects have to produce the expected efficiency gains (Heeks, 2006). Hence, management-oriented organizational reform creates better conditions to e-government implementation (Grönlund & Horan, 2004; Schuppan, 2009). On the contrary, poor change management strategy is one of the causes why the success rate of e-government projects is miserable, especially in developing countries (Kifle & Cheng, 2009). As

Nograšek (2011) argues, this is mainly because e-government is predominantly seen only as a technology mission and not as an organizational transformation issue. These evidences imply that BPR should be applied when designing G2C, G2B and G2G e-services. Public agencies should be organized to optimally carry out their functions.

BPR calls for drastic changes rather than incremental changes in organizations. Thus, it is expected to bring about nothing less than revolutionary change in organizations (Scholl, 2005). In line with this, McNulty & Ferlie (2004) points that governments have difficulties meeting the expectations of stakeholders because of the challenge of effecting a transformatory shift to a new form of process organization in a large and complex public service organization. According to Reijers & Mansar (2005), the challenges of effecting BPR are of twofold: technical and a socio-cultural challenge. They consider it as a technical challenge due to the difficulty of developing a process design that is a radical improvement of the current design and as a socio-cultural challenge because it results from rigorous organizational effects on the involved people, which may lead them to react against those changes. It is, therefore, hard to imagine that e-government would ever develop quickly and without tremendous friction.

The public sector has some specifics which make renovation projects considerably different (Indihar & Jaklič, 2007). Critical success factors when implementing e-government programs with comprehensive BPR components include the deployment of a creative team in problem solving, top management support, well informed investment decisions, effective engagement with stakeholders, knowledge of the supplier marketplace; knowledge of the delivery chain, effective risk management, knowledge about operations, active management of intended outcomes and

benefits and leadership at large (Ahmad et al, 2007). Beside the success factors, many authors also highlighted some failure factors in implementing BPR. Aggarwal (1998) (in Ahmad et al, 2007) highlighted failures of BPR implementation, which were related to managers' arrogance, resistance, crisis, cost, vision, etc. Hammer and Champy (1993) (in Ahmad et al, 2007) highlighted some failure factors like failure to have a process perspective, a fixed process which is not flexible enough to be responsive to the needs and requirements, not involving employees (i.e. bottom-up) in decision making, assigning someone who does not understand BPR, technology limitations, designing a project but with focus on cost reduction and downsizing, having a weak team, and problems with communication.

### **2.3.2 Business Process Change Management**

Change Management is a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state and by so doing it involves series of changes beginning with vision, introduction of skills, adding incentives and resources and designing an action plan bringing positive results (Sacheva, 2009; Al-Naimat, et al, 2013). Hence, it can be considered as the process of planning and coordinating the implementation of all changes with the objective of minimizing adverse impact of necessary changes; allowing the coordination and planning of changes; and maximizing productivity of persons involved in planning, coordinating, and implementing those changes. The vital importance of change management in today's competitive climate has been widely investigated (Aladwani, 2001; Saka, 2003; Ziembra & Oblak, 2013) and its importance is not only happen in business organizations but increasingly also in public sector organizations (Gichoya, 2005; Diefenbach, 2007).

E-government is beyond computerization or automation. As Sacheva (2009) argues e-government does not happen just because a government buys more computers and puts up a website. It should be considered as a paradigm shift in the traditional public service and requires transformation to new and more efficient administrative processes that can solve most problems of the old system. Due to such a requirement of e-government, managing the changes of e-government is very complex not only due to the resistance to change, but also because e-government services are frequently distributed over different IT systems and organizations (Vaidya et al, 2006; Apostolou et al., 2011; Napitupulu & Sensuse, 2014). Even if they are provided and managed by a single organization, their design and development rely on the collaboration of many people with different roles.

In line with this, Ndou (2004) cited in (Nograšek, 2011) also views change management in e-government implementation in two perspectives: change management approach and management of resistance to change. By change management approach the author refers to change management procedures established within organizations, e.g. identification of bureaucracy and cultures in the public sector that helps as e-government should revolutionize and reinvent government processes and functions whereas management of resistance to change refers to managing the resistance to change by the employees as this is one of the biggest barriers to a successful change.

Sacheva (2009) identified multiple causes why change in an e-government scenario fails. Few of them are: lack of buy-in from stakeholders, resistance to change, failure to take account of the impact of the changes on those people most affected, lack of clarity on vision, long implementation cycle, lack of support of top management, fear of job loss, fear of loss of power, standardization

and interoperability, cultural gap, and financial bottlenecks. Saka (2003) adds that the change management approaches mostly adopted to guide the change initiative do not consider contextual factors and put less emphasis to those who facilitate the change process. Hence, before proceeding with a proposed change initiative, organizations need to be clear about the organizational need for change, the specifics of what will change, the benefits of the change, and the impacts of the change especially on the people who are going to function in the new system. Nograšek (2011, p.17) developed a comprehensive framework that identifies changes that have to be managed in e-government implementation based on five core dimensions: technology, processes, people, organizational culture, and structure. As pointed out by (Nograšek, 2011) these elements of organization are interdependent, which means that changes in one of them cause changes in the other. For example, changes in technology cause changes in processes and consequently in people, culture and structure. (See Appendix II for details).

### **2.3.3 Challenges of e-Government Adoption in Developing Countries**

In recent years, developing countries have recognized and appreciated the contribution of e-government to the government agenda and some have started to take practical steps (Bwalya, 2009). E-government has multitude of benefits especially in developing countries (Ndou, 2004) such as transparency, anticorruption, accountability, increase in capacity of government, improvement in the quality of decision making, quality of service delivery to businesses and customers, cost reduction and efficiency gains, and network and community creation. If e-government is adopted well, it has the potential to transform government; but many benefits remain unrealized because the e-government initiatives face various challenges. Realizing the benefits of

the technology, thus, requires organizations to understand and overcome the challenges to their efforts (Gil-Garcia & Pardo, 2005).

There are numerous challenges that need to be addressed for successful implementation of e-government; and these challenging factors depend on the local context of any country (Nkwe, 2012). Researchers classified key challenges of implementing e-government in developing countries in different ways.

Furuholt & Wahid (2008), for instance, classified those challenges into three: (1) *management* - strategy, change management, political leadership, institutionalization, and continuous project monitoring and evaluation; (2) *infrastructure* - ICT infrastructure, legislation and financial resources; and (3) *human factors* – competence, skills, training and trust.

Alternatively, Backus (2001) classified the challenges into four: 1) *political* - strategy and policy, law and legislation, leadership, decision making, funding, international affairs and political stability; 2) *social* - people, education, employment, income, digital divide, rural versus urban areas, rich versus poor, literacy and IT skills; 3) *economic* - funding, cost-savings, business models, e-commerce; and 4) *technological* - software, hardware, infrastructure, telecom, IT workforce, maintenance, safety and security.

Other researchers (eg. Ronaghan, 2002; Dada, 2006; Ndou, 2004; Nkwe, 2012; Weerakkody et al., 2006) simply enumerated different challenges that developing countries face while implementing e-government. Among these are: low level of the internet penetration; ICT infrastructure

constraints (e-readiness, computer literacy, telecommunication equipment); lack of institutional framework supporting e-government (policy issues and legislation); lack of allocated budget for e-government deployment; digital divide; privacy and security concerns; limited IT skills and training (skills, capabilities, education, learning); change management (culture, resistance to change); culture; partnership and collaboration (public/private partnership, community and network creation); Strategy (vision, mission); leadership role (motivate, involve, influence, support); and lack of citizen awareness and participation. Chen et al, (2007) (in Karunasena, 2012) on his part made comprehensive summary of the key challenges that impede implementation of e-Government particularly in developing countries context as presented in Table 2.3. In general, the aforementioned barriers can have a significant effect on the development of government organizations' capabilities to leverage the multi-dimensional gains out of the investment on e-government.

**Table 2.3** Challenges faced by developing countries in implementing e-Government (Chen et al, 2007; Dzhusupova, et al., 2011)

<b>Factor</b>	<b>Developed countries</b>	<b>Developing countries</b>
History and culture	<ul style="list-style-type: none"> <li>○ Developed economies, a constant rate of growth, higher productivity and higher living standard</li> <li>○ Long history of democracy, and transparent government processes, procedures, policies and rules</li> </ul>	<ul style="list-style-type: none"> <li>○ Emerging economies, no significant economic growth or productivity, poor standards of living</li> <li>○ Short history of democracy, less transparent government processes, procedures, policies and rules</li> </ul>
Human resource	<ul style="list-style-type: none"> <li>○ Skilled and qualified personnel</li> <li>○ Relatively highly competent staff</li> <li>○ Sufficient professional training</li> <li>○ Government has the capacity to outsource appropriate human resources for e-government</li> </ul>	<ul style="list-style-type: none"> <li>○ Shortage of skilled personnel</li> <li>○ Lack of competent staff</li> <li>○ Lack of professional training</li> <li>○ Government has relatively poor capacity to outsource appropriate human resources for e-government</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>○ Highly sophisticated ICT infrastructure</li> <li>○ Relatively developed ICT infrastructure nationwide</li> </ul>	<ul style="list-style-type: none"> <li>○ Poor ICT infrastructure</li> <li>○ Poor ICT infrastructure nationwide</li> </ul>
Citizens	<ul style="list-style-type: none"> <li>○ High level of internet access and ICT literacy</li> <li>○ Digital divide exists</li> <li>○ Active participation in governmental policy making process through e-democratic initiatives</li> </ul>	<ul style="list-style-type: none"> <li>○ Poor internet access and ICT literacy</li> <li>○ Many suffering with digital divide</li> <li>○ Poor participation in governmental policy making process through e-democratic initiatives</li> <li>○ Lack of trust in online initiatives</li> </ul>

In general, implementing e-government requires a change in administrative processes because it is aimed improving and transforming the public sector. Among other factors, the success of e-government is impacted by the way business process change is managed. Thus, it is important to plan for business process change give due account for its successful implementation. Besides, it requires consideration of the institutional, cultural and administrative contexts.

## **2.4 Chapter Summary**

Studying information systems (IS) in general and e-government in particular cannot be done without considering its context. In order to understand information technologies in organizations and role of social practices in the ongoing use as well as change of technologies in the workplace, it is necessary to analyze not only the technological artifacts, but also the organizational and social aspects around those artifacts. This chapter showed how IT is associated to a given organizational context where it is deployed. Humans design, develop, and implement technology for a given purpose and then use the technology to perform tasks. Their degree of use of the technology is enforced or hindered by organizational structural properties. This in turn implies as how important it is to examine the technology in light of its context.

The chapter also presented the association between e-government and business process reengineering. E-government should be treated as a reform process and not only as computerization of the traditional public services. It, thus, requires re-engineering of the government's business processes, both within individual agencies and across government. It also requires paradigm shift in the way officials think and act. Hence, successful business process change is crucial to the success of e-government. Therefore, before launching an e-government

project, organizations need to be clear about issues such as the need for change, the specifics of what will change, the benefit of the change, the impact of the change especially on the human element, and plan for the change accordingly. Finally, this chapter reviewed the major challenges of e-government adoption in developing countries. Accordingly, e-government implementation in developing countries is still with full of obstacles that can be categorized under organizational and social, technological, political, economic, institutional and environmental factors. This again implies that successful e-government implementation also requires consideration of the institutional, cultural and administrative contexts.

# **CHAPTER THREE: LITERATURE REVIEW**

## **E-GOVERNMENT SUCCESS AND SUSTAINABILITY**

The purpose of this chapter is to review extant literature in order to identify the concepts that explain e-government success and sustainability both from enabling factors and evaluation dimensions. The review on e-government success bases on e-government literature about e-government evaluation (mainly on approaches for e-government evaluation). Presenting the different existing views on success, the first major section in the chapter aims to figure out what concepts in literature are related to e-government success and by which dimensions. The second major section of the chapter presents different views on sustainability and aims to figure out what concepts in literature are related to sustainability in general and e-government sustainability in particular and by which dimensions. Then, summary of the state-of-the-art along with the research gap is provided.

### **3.1 Approach to the Review of Related Literature**

Among other issues, the previous chapter (Chapter two) reviewed extant literature on the relationship between e-government and Business Process Change in organizations mainly based on e-government and Business Process Management (BPM) literature. E-government enables and is affected by organizational business process change. In this regard, Scholl (2003) pointed out that e-government increasingly impacts business processes and workflows in the public sector and at the same time is a special case of business process change enabled by information and

communication technologies (ICT). Administrative processes driven by information technology (IT) are conceptualized as a set of interconnected activities in which diverse interactions with technology may both shape and be shaped by new forms of organizing (Orlikowski, 1992).

The literature review in this chapter on e-government success and sustainability mainly focuses on reviewing existing approaches (models/ frameworks) of evaluating e-government success and sustainability. Favoring such literature review approach, Randolph (2009:3) stated that “a review of theories can help establish what theories already exist, the relationships between them, and to what extent existing theories have been investigated”. Such an approach is appropriate if the research aims to advance a new theory and by so doing, a theoretical review can help establish lack of theories or reveal that the current theories are insufficient, helping to justify that a new theory should be put forth (Randolph, 2009). So our intention in this literature review is to critically analyze the extant literature to justify our investigation. To that end, we have considered available piece of research on the topic to the best of our reach.

Hence, depending on the review of the extant literature, we seek to: (a) clarify the concepts of e-government success and sustainability, (b) provide a conceptualization which unfolds for both concepts the most used sub-concepts and constructs in terms of enablers and evaluation criteria, and (c) propose a research agenda for studying the interrelation of the two concepts (e-government success and sustainability) in detail. Accordingly the chapter is organized as follows: in the next section, the concept of success and its enablers/indicators are discussed with its implication for information systems (IS) in general and e-government in particular. The subsequent section

presents different views on the sustainability concept together with its enablers and evaluation dimensions. Finally the integrated research agenda is presented, along with the conclusion.

### **3.2 E-government Success**

As governments aspire to reach positive impacts, interest has emerged to evaluate the impact of such initiatives on public services in order to justify the costs. Evaluation of the information systems (IS) has been a popular research area over the past years (Petter et al, 2012), calling for appropriate evaluation measures. Wang & Liao (2008) points out that the measurement of information systems (IS) success has been widely investigated throughout the IS research community. It has been argued by Delone & McLean (2003) that if information systems research is to make a contribution to the world of practice, well-defined outcome measures are essential. Through time, much has changed in the evaluation of information systems such as the role of information systems in organizations, key stakeholders, expected benefits of the investments in information systems, the perception and measures in the evaluation of information systems (Petter et al, 2012). Meanwhile various IS evaluation models and techniques featuring different indicators have been developed and also applied to the e-government domain.

However, most of the measures to date focus on evaluating the immediate success of those initiatives while sustainability is an often ignored indicator of e-government even though project stakeholders usually expect the success to last after the project is deployed. Therefore we argue that the relation of the two concepts (e-government success and sustainability) needs to be explored as they both are related to same organizational reality, i.e. IT-enabled administrative processes.

This section reviews the different perspectives on success, its evaluation and enablers in the IS and e-government literature.

### **3.2.1 Concept of “Success”**

Though the causes of project success and failure have been the subject of many studies, there has not been one agreed upon definition for the concept of project success. Baccharini (1999:25) pointed that “project success is a core concept of project management but its definition remains elusive”. The concept of success has been used by different parties to represent different issues. It has been defined in numerous ways based on context it is used (Sharma, 2006). The Oxford dictionary, for instance, defines success broadly as “the accomplishment of an aim or purpose”. Some studies suggest that it is more effective to measure success considering stakeholder or business values (Egorova, et al, 2009; Smith, 2000). Such authors claim that a project achieves success by delivering value to various stakeholders that are actively involved in a project, are affected by its outcomes, or can influence its results. Baccharini (1999) on his part identifies two distinct components of project success: project management success and product success. Project management success focuses upon the project process and the successful accomplishment of cost, time, quality objectives, and the manner in which the project management process was conducted. Whereas product success deals with the effects of the projects’ final product. In general, such debates or views still raise interesting contradiction that needs further analysis of the concept. The following section reviews the different perspectives on e-government success, its evaluation and enablers in the IS and e-government literature.

### **3.2.2 Views on e-Government Success**

Most of the new technologies enter administrations through projects. Accordingly, from project management perspective, an information system (IS) project is considered successful if the scope is delivered with the quality agreed and within the set limits of time and cost. Focusing on the project deliverable, the success concept has been considered as crucial element in the evaluation of performance of information systems. According to Delone & McLean (2003), organizations use efficiency, effectiveness, and success interchangeably that in turn created ambiguity in the field regarding evaluation of IS impact.

As different stakeholders with varying interest and roles are involved during implementation of IS, there is little consensus among researchers and practitioners on how best to measure IS success in organizations. In line with this, the IS literature provides several definitions and measures of IS success (Urbach et al., 2009) and from early on there have been nearly as many measures as published studies (DeLone & McLean, 1992). In order to provide a more general and comprehensive definition of IS success and to integrate the multiple perspectives, DeLone and McLean (1992) reviewed existing definitions of IS success and their corresponding measures, and classified them into six major categories (system quality, information quality, IS use, user satisfaction, individual impact, and organization impact). The resulting multidimensional measuring model with interdependencies between the different success categories is nowadays still recognized (Urbach et al. 2009).

While numerous IS measures are found in the IS literature, it remains unclear which measures are most appropriate and how to best measure IS success in a particular context. The multidimensional

and interdependent nature of IS success requires careful attention to the definition and measurement of each aspect of the dependent variables (Seddon et al., 1999; Rai et al., 2002; Delone & McLean, 2003; Gable et al, 2008; Gil-Garcia, 2012). Intending to structure the efforts, Seddon et al., (1999) proposed two central dimensions by which they constructed a matrix for classifying IS effectiveness measures: (1) the stakeholder in whose interests the system is being evaluated, in one or more of the following roles: the independent observer who is not involved as a stakeholder, the individual seeking to be better off, the group also seeking to be better off, the managers or owners wanting the organization to be better off, the government wanting the society as a whole to improve; and (2) the type of system studied, categorized by: an aspect of IT use, a single IT application, a type of IT or IT application, all IT applications used by an organization or sub-organization, an aspect of a system development methodology, the IT function of an organization or sub-organization.

E-government success is also considered as a complex concept (like that of IS success), and its measurement involves multi-dimensional factors in nature (Alshawi & Alalwany, 2009; Osman et al, 2011). Thus, understanding and measuring e-government success is not an easy task and faces so many challenges, from deciding on a measuring technique to incorporating different perspectives on the success of a particular e-government initiative (Gil-Garcia, 2012). In particular, e-government services involve many stakeholders, each with different interests, costs/benefits and objectives, that impact the take-up of e-government services and the measuring of success.

According to Chutimaskul et al. (2008), the success of e-government depends on its quality and usage. Similarly, Scott et al. (2009) argue that although there is evidence of progress in the

provision of e-government services, success cannot be measured only by service provision without accounting for usage. Gil-Garcia (2012) on his part defines e-government success in terms of enacted technology (e.g., functional interface and other characteristics of the systems) and organizational outputs and outcomes (e.g., efficiency, effectiveness, and other potential results). By enacted technology this author refers to certain characteristics of the e-government initiative such as hardware, software, functionality, usability, or accessibility, the derived social relations and diverse uses whereas the potential outputs and outcomes are those stated in the goals and objectives of the e-government initiative such as efficiency, cost-savings, effectiveness, greater service quality, transparency, and/or increased citizen participation, among others. More specifically, improving the supply of e-government services, increasing the demand of citizens for e-government services as well as improved citizen satisfaction with them and with the overall public administration are considered as the main indicators of e-government success (Working Group on e-government, 2011).

Summing up, the literature agrees that any definition given for e-government success cannot be separated from the stakeholder perspectives. In practice, after all, successful e-government requires the engagement of all stakeholders (Rowley, 2011). While some authors (e.g. Gil-Garcia, 2012, with reference to Kraemer et al.) emphasize also objective outcomes such as the observed results of a computing package, the subjective outcomes of any evaluation (the perceptions and interpretations of those results by different groups inside or outside the organization) are usually dominating the success measurement (Petter et al., 2012). Therefore, we consider e-government success (adapted from Seddon, 1997, p.246) as a measure of the degree to which the evaluator

finds that the stakeholders, related to the e-government initiative in focus and in whose interest the evaluation is being made, are better off.

### **3.2.3 E-government Evaluation Revisited**

Evaluating e-government has become an important issue in recent years (Esteves & Joseph, 2006; Alalwan & Thomas, 2011). Recent e-government studies give more emphasis to e-government evaluation and the progress of e-government initiatives is being evaluated by different studies that are using different methods (Luna-Reyes et al., 2012; Fitsilis et al., 2009; Liu, et al., 2008) and addressing different perspectives (Wang & Liao, 2008; Esteves & Joseph, 2006). This is mainly because of the huge investment in e-government projects over the last few years which in turn triggered the need for having frameworks that can guide our understanding of e-government projects. The need for assessment frameworks also comes from the keen interest of the stakeholders to learn the factors resulting in the success or failure of a project. As to the importance of e-government evaluation, Kunstenlj and Vintar (2004) (cited in Esteves & Joseph, 2006) mentioned that “evaluation is vital to discovering the current state of e-government development, working out the extent to which objectives within various strategies and action plans have been reached, ascertaining strengths and weaknesses, shaping new guidelines, looking for examples of best practice and finally comparing different e-government organizations at the national and international levels”.

According to Fitsilis et al. (2009), majority of existing evaluation approaches are based on existing evaluation tools (e.g., SERVQUAL, Balanced Scoreboard, COBIT etc.) to provide evaluation

frameworks for e-government project progress, success and quality; and none of them incorporated issue of sustainability as an evaluation dimension.

An electronic government initiative can be measured or evaluated in many different ways (Luna-Reyes et al., 2012). Fitsilis et al. (2009), for instance, categorized existing evaluation approaches based on their purpose as those that assess either project results or project processes or customer satisfaction. Osman et al. (2011), on the other hand, classified different e-government evaluation models and frameworks into three categories: e-government value evaluation models; e-government success evaluation models and e-government service quality evaluation models. E-government assessment models can also be classified as impact and implementation assessment models (Heeks, 2006). Impact (or outcome) evaluation models analyze whether one can classify the e-government system as a success or a failure (eg. DeLone & McLean IS success Model); and implementation evaluation models analyze why it was a success or a failure: where the former focus on the outcome, these models focus on the process.

Although the literature has reported several e-government evaluation frameworks, researchers criticize the completeness of existing e-government evaluation approaches and argue that several shortcomings still exist in those previous works (Gupta & Jana, 2003; Esteves & Joseph, 2006). As a result the researchers agree on the need for existing e-government evaluation approaches to be further improved (cf. Fitsilis et al., 20092006; Alalwan & Thomas, 2011). Based on a comprehensive literature review, Luna-Reyes et al. (2012) noted that because e-government is a complex phenomenon, its evaluation approaches should measure and assess not only the final outcomes, results or benefits, but also the technological characteristics of the systems, and the

existing conditions in terms of organizational forms, institutional arrangements, and contextual variables. As to the relevance of IS evaluation models or evaluation tools to e-government evaluation, Al-Haddad et al (2011) argue that it is still debatable whether IS evaluation models or evaluation tools are really appropriate to the e-government domain.

### **3.2.4 Evaluation Approaches of e-Government Success**

How to assess and evaluate the successfulness of e-government projects and initiatives has been one of the critical research questions within the e-government community (Liu et al, 2008). General IS success models have received much attention from researchers, and numerous evaluation tools have been developed and applied to the e-government domain. The tools differ in objective, scope, measurement approach, constructs considered, and other factors (Delone & McLean, 2003; Petter et al, 2008; Petter et al, 2012). Scott et al. (2009) point out that although IS success models have been applied in numerous contexts predominantly in the private sector, little research has been conducted in identifying measures that determine specifically e-government success. Only in recent years studies have emerged to assess specifically the success of e-government (e.g. Wang & Liao, 2008; Hussein & Abdul Karim, 2007), and research is still under way to develop a comprehensive and integrative perspective (Luna-Reyes et al., 2012). Reddick (2005) (cited in Scott 2009), for example, suggests that studies evaluating the success of an e-government initiative can be clustered into two main areas, i.e. supply side studies examining government offerings and demand side studies examining citizen interaction with e-government services, with the majority of studies favoring the supply side approach.

Although not centered on e-government success as such, numerous attempts exist aiming at designing a framework for e-government evaluation. Some of the published frameworks are focused (e.g. on the citizens) whereas others are generic (i.e. comprehensive) evaluation frameworks (Alalwan & Thomas, 2011). For instance, Alalwan & Thomas (2011) (building on Gupta and Jana, 2003) suggested a flexible evaluation framework based on hard measures, soft measures, and hierarchy of measures to assess the tangible and intangible benefits of e-government.

The following approaches from the IS field in general have been used as e-government success evaluation tools: DeLone and McLean (D & M) IS success model, Maturity models, Design-Reality Gap model, Citizen-centric evaluation methods, and other models.

#### **3.2.4.1 D & M IS Success Model**

The IS success measures proposed by DeLone and McLean (1992) has been extensively reviewed, their model is based on interrelationships between six IS success variable categories: system quality, information quality, IS use, user satisfaction, individual impact, and organization impact. This model makes two important contributions to the understanding of IS success (Seddon, 1997; McGill et al., 2003): First, it provides a scheme for categorizing the multitude of IS success measures which have been used in the research literature. Second, it suggests a model of temporal and causal interdependencies between the categories.

Since 1992, many related studies have undertaken empirical investigations of the multidimensional relationships among the measures of IS success, and researchers have suggested several IS impact

measures (Seddon and Kiew, 1994; Urbach et al. 2008). Later on, DeLone and McLean (2003) discussed many of the important IS research efforts that have applied, validated, challenged, and proposed enhancements to their original model, and then proposed an updated IS success model which consists of six success factor dimensions: system quality, information quality, service quality, system use, user satisfaction, net benefits (further condensed by Gable et al, 2008, to information quality, system quality, individual impact, and organizational impact).

Although the degree to which traditional IS success models can be extended to investigating e-government systems success remains unclear (Wang & Liao, 2008), several researchers have adopted this probably the most widely cited IS evaluation model to assess the e-government success (eg. Chutimaskul et al, 2008; Scott et al, 2009; Hussein & Karim, 2007; Wang & Liao, 2008). Furthermore, Wang and Liao (2008) even confirmed explicitly that the updated DeLone and McLean model and its success dimensions are appropriate when developing and validating multidimensional G2C e-government systems.

#### **3.2.4.2 Maturity Models**

Supply side activities are increasingly evaluated based on e-government maturity models with conceptualizing and integrating various dimensions and stages according to the interest of measurements (Valdés et al., 2011) e.g. administrative practices and related processes (Andersen & Henriksen, 2006), interoperability (Gottschalk, 2009; Gottschalk & Solli-Sæether, 2008), public institutions' readiness to manage and implement e-government (Iribarren et al., 2008), or security (Korokola, 2012).

### **3.2.4.3 Design-Reality Gap Model**

The “design–reality gap” model by Heeks (2005) has received attention in the context of ICT for development, particularly e-government projects (Dada, 2006). It is used for assessing the reasons for success and/or failure of e-government projects by measuring the gap between 'where we are now' and 'where the e-government project wants to get us'. The model includes seven dimensions (information, technology, process, objectives & values, staffing and skills, management & structure, other aspects), and the larger the measured design-reality gap over all dimensions, the greater the risk of e-government failure.

### **3.2.4.4 Citizen-centric Evaluation Methods**

Demand side studies examining citizen interaction with e-government seek to enable government agencies to evaluate their online services and to help them understand the use or non-use by citizens: early efforts build on approaches from e-commerce, user satisfaction and Web site design, and research is ongoing to develop specific “citizen-centric” evaluation methods (Wang et al., 2005; Irani et al. 2012; Alruwaie et al., 2012).

### **3.2.4.5 Other Models**

The literature includes also other propositions for e-government success evaluation. For example Osman et al, (2011) focus specifically on cost, opportunity, benefit, risk, and satisfaction. Similarly, for inspecting websites, five “e-governance categories” have been used to monitor the e-government performance of municipalities: privacy/security, usability, content (access to information), interactive and transactional services, and citizen online participation (Holzer & Kim, 2008). However, the field remains fragmented (Gil-Garcia, 2012): the extant models aimed

at studying e-government success do not allow a more comprehensive and integrative exploration of e-government success in a way to facilitate understanding about the complex relationships among different kinds of factors relevant to the issue (Klischewski & Lessa, 2012).

### **3.2.5 Enablers and Evaluation Dimensions of e-Government Success**

The literature includes numerous attempts to analyze enablers and barriers to successful e-government. For example, Almarabeh and AbuAli (2010) point at crucial challenges that are expected to be addressed during the implementation of an e-government program: infrastructure development, law and public policy, digital divide, e-literacy, accessibility, trust, privacy/security, transparency, interoperability, records management, permanent availability and preservation, education and marketing, public/private competition/collaboration, workforce issues, cost structures, and benchmarking. Hussein and Karim (2007) argued that technological factors play a crucial role in IS success, discussing enabling factors such as IS competency, IS facilities, IS integration, IS structure, and user support. Management support and training are also crucial (Furuholt & Wahid, 2008; Zaied, 2012).

Causes of e-government failures in developing countries have been summarized e.g. in (Dada, 2006): lack of training schemes and qualified staff, lack of change management efforts, lack of educating citizens about the value and benefits of e-government, high turnover rates of government IT staff because of uncompetitive payment and employment conditions as compared to private sector, lack of public sector skills, large design-reality gaps as a result of using an off-the-shelf solution from an industrialized country for a developing country, large gap between the skilled leaders who can afford technology, and the unskilled poor who cannot afford the same.

Similarly, Kumar and Best (2006) identified critical failure factors for an e-government initiative as: lack of adequately trained personnel, lack of sustained public leadership, commitment, and institutionalization, shift in existing power relationships, lack of consistent evaluation and monitoring, and lack of involvement of all stakeholders.

### **3.3 Sustainability**

The word sustainability was probably used for the first time in 1712 by the German forester and scientist Hans Carl von Carlowitz (Garde et al, 2007). For most of the time the term's usage has been mostly restricted to ecological aspects (Shriberg, 2002), but the concept may be applied to a variety of phenomena. Many argue (e.g. Craig, 2008; Ikerd, 1997; Kidd, 1992; Laszlo et al, 2010) that sustainability arose not as a narrow ecological concept, but as a novel, integrated approach to environmental, social and economic progress. This evolutionary path presumes that sustainability is, at its very root, a transcendent concept with the ability, even the responsibility, to become a cross-disciplinary, holistic paradigm. Nowadays the concept has grown in recognition and importance (Silvius & Schipper, 2010), and the issue is not whether sustainability should include social and economic issues in its modern conceptualization, but rather how to implement sustainability as an integrated approach.

Due to the recent world crises, sustainability is considered as the most important challenge of our time and the immediate future (Silvius et al., 2009) and attracted interest of different parties. Throughout the last decade, many, if not most, organizations have started to seriously consider

issues related to sustainability; and it is possible to see that this represents a major change in companies' approaches.

The sustainability concept is defined differently by different institutions and individuals, driven by what suits their context of applications, with no agreed definition of sustainability having emerged yet. Some definitions of sustainability are broad encompassing various dimensions while others are narrowed to a given aspect or context (Chengalur-Smith et al., 2010). We also find differences in the earlier and recent definitions of the concept, both in focus and coverage. In this section, various definitions of the concept with possible relation to e-government are reviewed along with related dimensions and indicators.

### **3.3.1 The Concept of “Sustainability” and Sustainable Development**

Research related to sustainability is still at an early stage but is increasing rapidly (Linton et al., 2007). Dyllick and Hockerts (2002) identified three key aspects of sustainability: integrating economical, environmental and social aspects, integrating short-term and long-term aspects, and consuming the income and not the capital. Elkington (cited in Silvius & Schipper, 2010) declared the three interrelated dimensions (social, environmental, and economical) as the “triple bottom line” or “Triple-P (People, Planet, Profit)” concept: sustainability is about the balance or harmony between economic sustainability, social sustainability and environmental sustainability. The concept suggests that three dimensions are interrelated and therefore may influence each other in multiple ways. And although these interrelations are generally acknowledged, it should be noted that regional differences exist with regards to the relative emphasis placed on each pillar (Silvius & Schipper, 2010; Evans & Yen 2006). In (Western) Europe, for instance, sustainability is mainly

about environmental concerns, where in Africa the social and economic concerns seem to be prevailing. In an increasingly globalized economy, however, these differences should diminish over time.

Recognizing the heavy deterioration of the human environment and natural resources, the UN decided to establish the World Commission on Environment and Development (WCED), commonly referred to as the Brundtland Commission which was officially dissolved in December 1987 after releasing the Brundtland Report (also known as "Our Common Future") in October 1987 (United Nations, 2010). The objective of this commission was to rally countries to work and pursue sustainable development with shared sustainability goals by identifying sustainability problems worldwide, raising awareness about them, and suggesting the implementation of solutions. Accordingly, sustainability in the context of sustainable development is defined by the World Commission on Environment and Development (1987) as “forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs” (United Nations, 2010). This broad definition emphasizes the aspect of future orientation as a basic element of sustainability, and this care for the future implies, among others, a wise use of natural resources and other aspects regarding the environment. It also implies a link between economic activity and the conservation of environmental resources (Silvius et al., 2009).

Pointing to previous studies, Morefield et al. (2004) presented sustainability as a meta-discipline that seeks to objectively and quantitatively assess needs among often conflicting economic, technological, environmental, and societal objectives. As to these authors, the research literature often differentiates between external and internal views of systems sustainability. In the external

view, a sustainable system is one that matches the changes that the system can absorb; whereas in the internal view, sustainability is defined as the long-term ability to balance the allocation of resources like time, knowledge, and money against the measured value of an accepted sub-system.

Sustainable development is a new area that has started to be incorporated into mainstream operations management, logistics and information systems (Piotrowicz & Cuthbertson, 2009). The concept of sustainable development (and even sustainable community) has been debated for years and the meaning varies according to the interest, needs and values of different societies; nonetheless, most stakeholders focus on promoting a better quality of life for their citizens (Velázquez et al., 2008). Accordingly, sustainable development is an evolving ideal of development efforts with no end known in advance, and which is characterized by its complexity and uncertainty (Bagheri & Hjorth, 2007).

From sustainable development point of view, wide acceptance has been reached, in recent years, on the need for compromise between an economic growth, social wellbeing and a wise use of natural resources, and each goal cannot be reached without considering and effecting the other two. This implies that sustainability requires also a social and an environmental perspective, next to the economical perspective, on development and performance.

### **3.3.2 Sustainability in the Context of IT Use**

Meanwhile major players in the IT/IS industry have started to seriously consider issues related to sustainability, although the IT industry was not perceived to be greatly aware of sustainability needs just a few years ago (Piotrowicz & Cuthbertson, 2009).

Specific to the relationship between sustainability and ICT, Silvius et al. (2009) classify related previous studies in to two broad categories: studies on ICT and environment sustainability; and ICT and social sustainability. Apparently ICT came with both opportunities and challenges. For instance, it has not only rendered us positive gains because of paperless offices and tele-working, but also come up with a challenge of increased power consumption and hazardous waste because of ICT (Silvius et al., 2009). From social sustainability point of view, ICT contributes to development goals because of its unique characteristic to dramatically improve communication and the exchange of information to strengthen and create new economic and social networks (United Nations Development Program, 2008). According to (Silvius et al., 2009), this is because ICT is pervasive and cross cutting; it is a key enabler in the creation of networks; it fosters the dissemination of information and knowledge; it can radically reduce transaction costs; it can enhance efficiency; it enables innovation; and also it facilitates disintermediation.

In their study relating sustainability to ICT projects, Silvius et al. (2009) also proposed a framework to identify the sustainability aspects of those projects. In their framework they recognize the people-planet-profit concept of sustainability and suggested that projects are measured against criteria on social sustainability, environmental sustainability and economic sustainability. As to these authors, these criteria or indicators should then be applied on the level of the project itself, its result (an asset, product or a change) and its effect (what the asset delivers).

Piotrowicz and Cuthbertson (2009) similarly discuss the emerging issue of IS evaluation with respect to sustainability and argue that sustainability needs to be considered when decisions on

IT/IS investments are being made. Focusing mainly on the supply chain domain, they conclude with a research agenda for the extended information technology IT/IS evaluation which should consider (among other things): “the overall impacts of IT/IS on sustainability and how to measure this; the social and environmental external costs of IT/IS usage; the extension and modification of existing evaluation tools and methods to incorporate sustainability dimensions in IT/IS evaluation; the inclusion of sustainability issues within pre-investment IT/IS planning; the creation of guidelines and metrics that consider sustainability impact [...]; the design of applications to monitor sustainability performance; analysis of IT/IS infrastructure, applications design, and their usage in regards to their impact on sustainability; analysis of IT/IS driven business models and their impact on sustainability; impact of outsourcing and off shoring on sustainability; cooperation between business managers and policy makers regarding the requirements for assessing the social, environmental and economic impacts of IT/IS” (ibid., p. 500).

Apparently sustainability adds even more complexity to IS evaluation, which is already considered to be a complex issue (Irani, 2002). Current IS evaluation approaches concentrate mainly on economic impacts, with some inclusion of social aspects, however mainly within the organization; further social impacts on business relations and the society at large may be considered under the popular term of corporate social responsibility. However, a truly sustainable evaluation must include an assessment of all the social and environmental impacts. This in turn implies that its evaluation is not an easy task, especially in relation to IT/IS and its usage, but it may significantly change the perception of IT/IS solutions among stakeholder groups (Piotrowicz & Cuthbertson, 2009).

Molinari (2010) also considers sustainability as a complex task with multi-faceted dimensions. According to this author, sustainability deals with foreseen effects of the Project/Program (P/P) in the medium to long term going beyond the results produced and/or the benefits induced within the P/P's scheduled life. Its assessment, thus, is related to the progress of time as opposed to such measures of P/P as efficiency and effectiveness which can be best demonstrated after implementation or right at the end of P/P, using information derived from its internal budget or other accounting evidence (Molinari, 2010). Elliot (2009) similarly argues that many previous literatures focus on a particular aspect of the concept without acknowledgement of its multi-faceted nature. However, the three pillars of sustainability – environmental quality, social equity, and economic development – need to be managed holistically in order to deliver balanced and sustainable outcomes (Craig, 2008). Pointing to previous studies,

In recent years, the uses of ICT as well as different types of systems (e.g. e-government applications) have been examined in the context of sustainability (e.g. Ezz, 2005). In the IS/IT perspective, Pade et al. (2011) put the focus of sustainability as having two views of analysis, that is, the sustainability of ongoing rural ICT access, independent of specific technologies or projects; and/or the sustainability of rural development results through ICT-enabled development. According to Kanungo (2004), as IT became more common in organizations, it started to become clear that information technology is necessary, but not sufficient to experience increases in productivity. The big gains come typically through complementary activities like the reorganization of work. Therefore, the debate has changed from whether or not to invest strategically in IT to how to leverage the strategic, tactical and operational investments in IT for sustained advantages at the individual, group, enterprise and inter-organizational level.

Recognizing the importance of the concept of sustainability to the field of IS, we adopt Kanungo's (2004) notion of the concept of sustainability to IT, i.e. defining sustainable IT investments as "those whose benefits keep continuing into the future".

In another recent development, Waheed et al. (2011) argue that the implementation of a sustainability paradigm demands new choices and innovative ways of thinking. The authors further discussed that since sustainable development became an integral part of decision-making and planning in the international arena, several approaches and conceptual frameworks have been proposed in various disciplines which are diverse as the range of the disciplines where sustainability is applied. The main differences among frameworks are the way in which dimensions or categories of sustainable development (i.e. environment, social, and economic) are conceptualized, the inter-linkages between various categories, the way the issues are grouped to be measured, and the concepts by which the selection and aggregation of indicators are justified (Waheed et al, 2011).

For e-government several areas have been identified that suffer from unsustainable activities in the organizational environment (Heeks, 2001; Janowski, 2011; Kanungo, 2004; Walsham and Sahay, 2006), non-local agents leave after project ends (Heeks, 2001; Walsham and Sahay (2006). The call for relating the public sector and the sustainability concept has been made some years ago, e.g. Craig (2008): "The public sector could and should be doing more to focus on the environmental, economic and social sustainability impacts of its own activities." Recent work by Dzhusupova et al. (2011) on sustainability of electronic governance initiatives also confirms that sustainability is well recognized as a challenge but so far there is little evidence of research that

discusses this challenge and how it could be addressed. In a nutshell, the afore mentioned evidences from extant literature reveal that sustainability is especially critical for developing countries where there are problems of technology transfer and many e-government initiatives are donor-driven and key stakeholders are often ignored in planning.

### **3.3.3 Sustainability Vs Success**

Although some research has been carried out on success and failure of information systems in developing countries, little work has been carried out on sustainability and even fewer studies focus on the long-term sustainability of e-government initiatives (Furuholt & Wahid, 2008).

As well presented in section 3.1.2 above, sustainability is becoming a cross-disciplinary concept. Thus, the issue is not whether sustainability should include social and economic issues in its modern conceptualization, but rather how to implement sustainability as an integrated approach. In the modern society, sustainability as a concept is being highly associated with that of success. In line with this, Laszlo et al. (2010:Abstract) redefine success (in relation to sustainability) as: “one that embraces financial, social and environmental sustainability as the cornerstones of a holistic approach to value creation and gives rise to conditions for life-affirming dynamics of value exchange to unfold in perpetuity.”

Apparently it has been difficult to materialize successful as well as sustainable e-government initiatives especially in developing countries for various reasons. Over the years, many e-government projects were unsustainable implying that those projects did not deliver what the

stakeholders aspire to attain at the end of the day from those investments in a continuous basis. Although the ideal case is sustaining successful e-government projects, it is quite possible for a project to sustain without being successful (Heeks, 2002). Sustainability is still important because unsustainability is a form of failure, and this implies that sustainability is not the same as success but it is necessary for success (Heeks, 2005). Hence, we argue that these two concepts (e-government success and sustainability) are inseparable and should be considered together for completeness.

Pamlin and Thorslund (cited in Piotrowicz & Cuthbertson, 2009) also pointed that some organizations, including major players in the IT industry, have started to seriously consider sustainability issues and it is possible to see that this represents a major change in companies' approaches, as the IT industry was not perceived to be greatly aware of sustainability needs just a few years ago. However, relating e-government success and sustainability is still scarce from developing areas (e.g. Janowski, et al, 2010; Dzhusupova et al, 2011; Kumar & Best, 2006).

### **3.3.4 Sustainability vs. e-Government Maturity**

The term maturity is used as classification schemes in different academic disciplines (Andersen & Henriksen, 2006). It is often used to characterize the state of a given level in a continuous process. From process point of view, for instance, a maturity can be considered as a point at which a process requires minimum changes to achieve its intended purpose. Thus, if certain maturity level is met, then the system looks for meeting the next maturity level. In general the maturity level of an e-government can be linked to the level of integration of processes, technology or other

organizational entities. The term, thus, can also belong to different issues such as process maturity, interoperability maturity, system maturity, etc.

Different maturity models have been developed in different disciplines (eg. software engineering, business, etc) to assess maturity. These models consist of a set of levels that describe how well the behaviors, practices, and processes of an organization can reliably produce required outcomes and can have multiple uses within an organization (Curry & Donnellan, 2012). Capability Maturity Model in software engineering, for instance, uses the idea of software process maturity to describe the difference between immature and mature software organizations (Marchewka, 2009).

E-government Implementation is considered as continuing process, and most often its development is conceptualized in stages (Layne and Lee, 2001; Almarabeh & AbuAli, 2010). With this view in mind, different parties have proposed various types of e-government maturity models ranging from two to five levels in order to direct and benchmark e-government implementation (eg. Layne & Lee, 2001; Andersen & Henriksen, 2006; Gottschalk, 2009; Klievink & Janssen, 2009).

In the stages of growth model, for instance, the evolution of e-government is modeled in five progressive stages as: (1) Emerging: the government's online presence is established; (2) Enhanced: government sites increase in number and complexity, and the information becomes more dynamic; (3) Interactive: users can download forms, e-mail officials, and interact through the Web; (4) Transactional: users can pay for services and transactions online; and (5) Networked: full integration of electronic services across public agencies (Valdes et al, 2011). Thus, a maturity

stage reflects the level of e-government maturity, the degree of technology complexity, the degree of systems sophistication, and the level of interaction with users (cf. Karokola et al, 2012) helping governments measure the progress of e-government implementation.

It is common for a change in a given issue (let us say a change in process or way of doing things) to slip back to its previous situation if the facilitating conditions don't exist or due to other reasons. Thus, it is more probable that such things cannot happen if a given maturity level is attained because the possibility for the system to return back to its previous situation is less likely in a mature system since maturity denotes an entity that has developed and having reached an advanced and irreversible stage. As per the operational definition of sustainability in this research, sustainability is related to keeping up or possibly improving the benefits attained from investments in e-government. Indeed, sustainable ICT can develop solutions that offer benefits both internally and across the extended enterprise (Curry & Donnellan, 2012). Accordingly, benefits obtained or gained from an e-government project can be sustained provided that the e-government attained a given maturity level and this in turn implies that there exists relationship between maturity and sustainability. So that way, maturity models may assist organizations in administering their sustainability capability.

### **3.3.5 Enablers/ Barriers and Evaluation Dimensions to e-Government Sustainability**

The relationship between the public sector and the sustainability concept has been made some years ago (e.g. Craig, 2008). Recent work on sustainability of e-government initiatives confirms

that sustainability is well recognized as a challenge, but so far there is little evidence of research that discusses this challenge and how it could be addressed (cf. Walsham & Sahay, 2006).

Sustainability is especially critical for developing countries where there are problems of technology transfer and many e-government initiatives are donor-driven and key stakeholders are often ignored in their selection, design, development, and implementation. For e-government several areas have been identified that suffer from unsustainable activities in the organizational environment such as:

- non-local agents leave after project ends (Heeks, 2001; Walsham & Sahay, 2006; Dzhusupova, 2011)
- weaknesses of the central e-government institutions which fail to balance external and internal interests (Heeks, 2001)
- unpredictable changes in the laws and regulations, unpredictable and inconsistent economic growth (Roztocki & Weistroffer, 2011)

As to enablers to sustainability, Heeks (2005) argued that capacity, utility, and embedding are at the core of sustainability of e-development projects. By capacity he means the project must match the available resources on an ongoing basis which include money, skills, data and technology and this makes a project usable. By utility he means that the project must keep meeting the needs of at least some stakeholders as well as it must continue to be useful to someone and this makes a project used. Embedding is about institutionalization, i.e. the project must be institutionalized or embedded in the rules and norms, the culture and values of its setting, and this makes a project outcome used as a matter of routine.

According to Craig (2008), understanding and inertia are key enablers or barriers in actualizing sustainability. Understanding is about widespread, systemic and holistic recognition of the opportunities for creating a sustainable public sector. He argues that lack of understanding exists in two aspects, i.e. the top-level vision of politicians and senior public servants, and the models and frameworks of sustainability required to design and implement change. By lack of inertia he means insufficient internal commitment and leadership, institutional barriers, information gaps, adverse public sector cultures and the fact that the idea of sustainability has not been a mainstream public management concept like equity, efficiency or effectiveness.

Dzhusupova et al (2011) identified seven main challenges influencing the sustainability of e-government programs in developing countries: ownership, leadership, vision and strategy, institutional capacity, design versus reality, capacity and awareness, and dependence on external assistance. Based on this they propose a framework of six interrelated activities in order to implement four principles (national ownership, strong leadership, stakeholder engagement, balancing internal and external roles).

Focusing on e-participation, Molinari (2010) presented six dimensions of sustainability: (1) stakeholders' ownership, i.e. the actual level of sharing of the objectives and achievements of the Project/Program (P/P) by the stakeholders involved; (2) institutional compliance, i.e. the extent to which the P/P is "embedded" in the organizational/regulatory structures of the community; (3) financial autonomy, i.e. likeliness of the P/P to continue after the end of funding, the availability of sufficient funds to cover all costs; (4) socio-cultural integration, i.e. the P/P taking into account

the local perception of needs and respects participants and beneficiaries cultures and beliefs and how the changes induced by the P/P can be accepted by the stakeholders involved; (5) technical feasibility, i.e. the extent to which the technology and knowledge provided fit into the existing skills and infrastructure available to participants and the likeliness of beneficiaries to operate and maintain the technology acquired without further external assistance; (6) continuity over time, i.e. the concrete possibility of extending or successfully replicating the P/P in focus or other similar interventions.

Pade et al. (2008) also proposed five categories of sustainability (social and cultural, institutional, economic, political, and technological) that need to be considered in the implementation and management of rural ICT projects and identify nineteen critical success factors of sustainability which can be associated and monitored according the above categories.

From empirical data, Lozano (2013) found leadership as the main internal driver. Leaders are important factors in sustainability, either acting as advocates, resources, or barriers. Therefore, building a leadership team, rather than identifying a single leader, can help encourage successes. Having a clear vision can also help ensure sources of support for programs and services (Office of the Adolescent Health, 2014). Lozano (2013) also found shared values, resources and cost saving, company culture, customer demands and expectations, moral and ethical obligations to contribute to corporate sustainability, and champions as other internal drivers of sustainability. Based on review of literature, Lozano (2013) also identified the following points as internal motivations of corporate sustainability: attracting and retaining employees; improving trust within the company i.e. stronger employee motivation and commitment; having more compliant workforce; increasing

employee productivity; helping to increase product quality; helping to boost innovation and innovative practices; helping manage risks, intangible assets, and internal processes; improve performance and generate more profits and growth; and reduce costs while improving process efficiencies and reducing waste. Similarly, Office of the Adolescent Health (2014), identified eight key factors that can influence whether a service, program or its activities and benefits will be sustained over time: (1) create an action strategy; (2) assess the environment; (3) be adaptable; (4) secure community support; (5) integrate program services into community infrastructures; (6) build a leadership team; create strategic partnerships; and (7) secure diverse financial opportunities.

Regarding sustainability assessment, Waheed et al. (2011) indicated that there is no comprehensive framework for evaluation. None of the frameworks have the capability to deal effectively with different issues of sustainability and the flexibility to be used in various disciplines with a unified interpretation. However, as the topic is relevant for research and practice in e-government, we seek to find a way forward: Figure 3.1 captures our view of the concepts and constructs which so far have been related to the enabling and evaluation of e-government success (see sections above) as well as e-government sustainability (as discussed in this section). Since sustainability is usually associated with the discussion of success, it is not a surprise that we find much overlap of the related concepts and constructs. Hence, we identified for sustainability only those aspects which significantly extend the discussion of e-government success. Note also that for evaluation of e-government sustainability so far only dimensions have been discussed while for evaluating e-government success more specific concepts and constructs are developed and applied.

### 3.4 Research Agenda

The literature review reveals that including the sustainability perspective in managing and assessing the success of e-government initiatives is just at the beginning. Due to the lack of clarity in conceptualization, the relationship between the two concepts still requires further research. The research agenda below (Klischewiski & Lessa, 2012) is driven by the idea that research is not only limited to generating new knowledge but this knowledge also makes an impact, eventually. It intends to lay out how to explore full cycle of the multidimensional relation based on the enabling factors and evaluation dimensions summarized in Fig. 3.1 below. The research agenda is categorized in four themes: empirically assessing and understanding the problems in practice; providing sufficient theory to explain the phenomena; developing assessment approaches (e.g. measurements); and recommending best practice:

- i. *Understanding ICT-related sustainability problems:* What internal and/or contextual problems impact the sustainability of e-government initiatives? Which aspects of change management and maturity in organizations are closely related to sustainability? What is the perception of stakeholders regarding sustainability issues related to e-government success? How does the action and interaction of different stakeholders impact the long-term success? What attributes of the technology have an impact on the activities related to administrative processes and to the sustainability of e-government projects? What is the impact of dedicated ‘sustainability’ projects?
- ii. *Developing theoretical frameworks:* Can/should e-government sustainability be defined independently of e-government success or rather as a sub-concept? What can established theories contribute which explain phenomena of IS in context, e.g. systems theory,

institutionalization theory, structuration theory, or actor-network theory? What are the appropriate constructs and variables related to enabling and evaluating e-government sustainability? How should we conceptualize the multidimensional relationship between e-government success and sustainability? What conditions have to be fulfilled in order not only to explain but also to predict e-government sustainability?

- iii. *Developing reliable assessment approaches:* What types of facts need to be considered and what kind of data is needed to assess e-government sustainability in difference to “only” success? What are the variables and scales to measure the sustainability of e-government initiatives? What degree of context adaptability is needed to evaluate localized projects? How can we trace involvement and related perspectives of stakeholders over time and measure long-term e-government benefits?
- iv. *Recommending best practice:* How can public organizations incorporate a sustainability perspective in their e-government strategy and planning and what is the role of ICT in this? How can stakeholders be mobilized to attain sustainability of e-government initiatives? How can learning from previous e-government projects be ensured? How can IT acquisitions be evaluated upfront regarding their sustainability impact? How should IT resources be managed and integrated into administrative processes to assure success and sustainability? How can best practices be identified and transferred to other settings? How can external factors that are frequently affecting IT-enabled administrative processes be managed in order to avoid negative impact on sustainability?

All these inquiries need to break down the concept of sustainability which requires more theoretical background as well as empirical findings in order to determine the appropriate constructs and variables. This research is not for defining the concept of e-government sustainability once and for all, but mainly aimed at clarifying the potential relation between success and sustainability of e-government based on the related constructs and variables.

### **3.5 Chapter Summary**

A review of existing theories (and models, frameworks, etc) as part of academic research in a given subject area is appropriate if the research aims to advance a new theory (Randolph, 2009). Our intention in the literature review was to critically analyze extant literature to justify our investigation. To that end, we have first tried to clarify the concepts of e-government success and sustainability as these concepts have varied meanings and conceptualizations in the IS literature. The review of the extant literature revealed that there is no one and agreed up on definition for the concepts of e-government success as well as sustainability due to multitude of reasons. As it is important to have working definition for both concepts, an attempt is made in this chapter to have contextual definition of both concepts in order to use throughout this research. Although e-government success and sustainability are both relevant concepts to assess IT-enabled administrative processes in practice, e-government research has not yet elaborated the two concepts in an integrated fashion. Figure 3.1 provides a conceptualization which unfolds for both concepts the most used sub-concepts and constructs in terms of enablers and evaluation criteria. The literature review revealed that the current theories/models/frameworks of e-government evaluation are insufficient to assess e-government success and sustainability in an integrated manner, and in turn justifies that a new theory should be put forth.

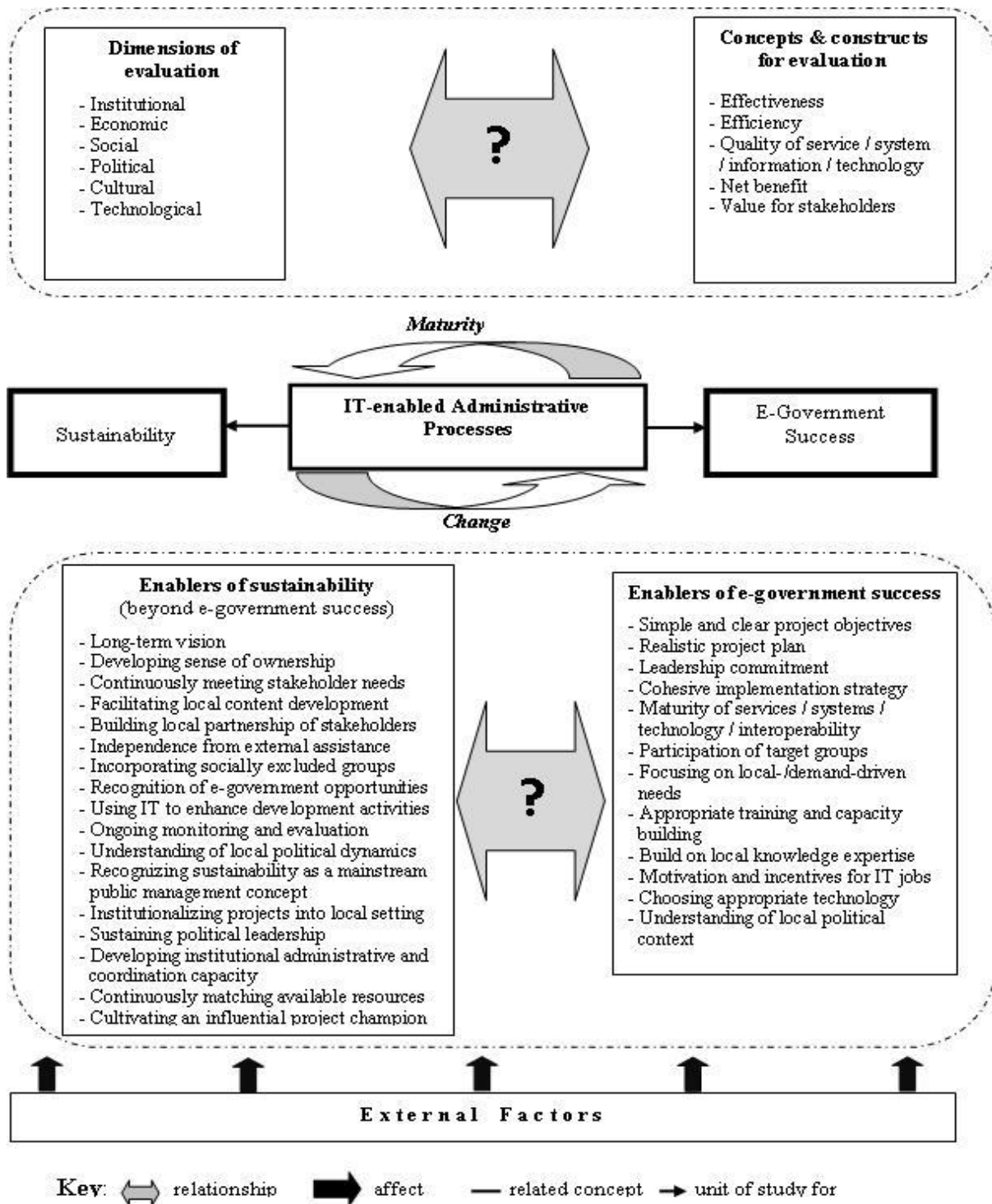


Figure 3.1: Conceptualizing the relationship between sustainability and e-government success (Klischewski & Lessa, 2012)

The literature review also unfolded the state-of-the-art in relation to sustainability of e-government success and also renders the challenge of future research in this area. Thus, we argue that it needs a more systematic approach to explore the relation between e-government success and sustainability and we have accordingly proposed an integrated research agenda for empirically assessing and understanding the problems in practice, providing sufficient theory to explain the phenomena, developing assessment approaches, and recommending best practice. Finally, the provided conceptualization and research agenda solely depend on literature review; and to be supported based on rigorous argumentation based on empirical data later on.

## **CHAPTER FOUR: RESEARCH DESIGN AND METHODOLOGY**

The Research Design and methodology chapter provides the blueprint as how to collect data and link the data to be collected (and the conclusions to be drawn) to the initial questions of the study. The chapter is divided into four major sections. First, it provides details on philosophical orientation of the research. The next section is about the research strategy where the research approach is described. Section three deals with the case study research design and covers the reasons for case selection, data sources, and a brief summary of the analytic tool adopted to guide the data analysis. Finally, issues on research techniques are presented such as data collection techniques, analysis strategy and the validity & reliability measures that are applied in order to ensure the rigor and quality of the research.

### **4.1 Philosophical Orientation**

There are three main philosophical orientations in information systems research: positivistic, interpretive or critical (Myers & Avison, 2002:5). Assumptions underlying a research philosophy can be understood in terms of a researcher's beliefs about reality (Orlikowski & Baroudi, 2002). Accordingly, a positivistic researcher maintains that social and physical reality exists 'out there'; and so ignores that people think and act and are active makers of their physical and social reality (Orlikowski & Baroudi, 2002). Interpretive researchers, on the other hand, are concerned with how people create and maintain their social world; and these researchers attempt to develop an understanding of how people construct meaning in their natural settings (Walsham, 2002).

Whereas critical researchers assume that people can consciously act to change their social and economic conditions; these researchers focus on the oppositions, conflicts and contradictions in society and how to eliminate the causes of alienation and domination (Myers & Avison, 2002).

As presented in chapter three, e-government success and sustainability are two different concepts that are related to each other. However, how the relationship between these concepts is formed and what it consists of is not yet explored. This research tries to explore how the relationship between these concepts is formed and what it consists of. Extant literature revealed that these two concepts have no agreed upon definition and the concepts imply socio-cultural issues. Besides, information systems do not exist apart from humans' action and they cannot be understood, or studied in an objective way independent of the perception of the human elements (Orlikowski & Baroudi, 2002). Hence, an interpretive approach is adopted for this research mainly because our aim is to figure out the interplay between the facilitating or hindering factors in the social and organizational setting in which WoredaNet services are implemented, and base this understanding on the perception of the actors in it.

## **4.2 Research Strategy**

The goal of the researcher and the nature of the research topic influence the selection of a strategy (Benbasat, et al, 2002; Yin, 2009). As suggested by Orlikowski & Baroudi (2002), the development and use of information technology within organizations is inherently contextual and that it is difficult to adequately capture these characteristics. Therefore, the research strategy selected for this research is a case study. Given the interpretive stance adopted in this research and the 'How' type of the research questions, case study approach is appropriate research strategy for

the study. Case research strategy is particularly well suited to IS research because the technology is relatively new and interest has shifted to organizational rather than technical issues (Benbasat, et al, 2002). The case study approach is adopted in this research in order to examine the different institutional and other challenges of sustaining e-government services. Such an approach allows the investigation of systems in particular natural institutional settings in order to understand the nature and complexity of the processes and actions involved (Walsham, 1995; Montealegre, 1999; Dube and Pare, 2003; Yin, 2009). In this regard, Yin (2009) further states that case studies are seen as appropriate when investigators either desire or are forced by circumstances to cover contextual and complex conditions and to rely on multiple and not singular sources of evidence.

If interpretive case studies are carried out and written up carefully, they can make a valuable contribution to both IS theory and practice (Walsham, 2002). However, generalizability of results from such case studies has been a concern for interpretive researchers. In relation to this, Yin (2009) argues that case studies are generalizable to theoretical propositions and not to populations; and accordingly the goal in case studies is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization). Walsham (2002) views generalization from interpretive case studies into four different types: the development of concepts, the generalization of theory, the drawing of specific implications, and the contribution of rich insights. More importantly, theory-building from case study research is particularly appropriate when there is still little known about a phenomenon or there is not enough literature to engage in incremental theory building and this strategy is well suited to capturing the knowledge of practitioners and developing theories from it (Benbasat, et al, 2002).

### 4.3 Case Study Research Design

This section focuses on the elements of case study research design including case study research questions, the study proposition, type of case study adopted, sampling issue and strategies for enhancing rigor of the case research.

#### 4.3.1 Leading Case Study Research Questions

Under the umbrella of the two main research questions of the study in section 1.2, the following are leading case study questions that guided the case study and answered during the field work.

- i. **Questions #1:** What is the performance of selected admin processes after they have been enabled by WoredaNet services in focus?
- ii. **Questions #2:** What is the stakeholder perception of the success and sustainability of using WoredaNet services and by which criteria (evaluation dimension)?
- iii. **Questions #3:** What are the perceived enablers for making the WoredaNet initiative successful and sustainable?

Based on the operational definition of e-government success and sustainability for this research, stakeholder's perception is the basis of the fact collection during the field work. Accordingly, the first leading case study question focuses on disclosing stakeholders' perception on the performance of the admin processes after they are being enabled by WoredaNet services. Then, the second leading case study question focuses on getting the stakeholders' perception on the success and sustainability of using the WoredaNet services and their reasons why they wanted to take that position. Finally, based on the outcomes of the first two leading case study questions, the third

leading case study question focuses on identifying the perceived enablers for making the WoredaNet initiative successful and sustainable. The outcomes of these three leading case study questions ultimately help in figuring out the potential relationships between the enablers of the two core concepts and what it consists of (i.e., main research question #1). The second main research question is driven by the idea that research is not only limited to generating new knowledge but also the knowledge shall ultimately make an impact. Thus, answering main research question #1 helps identify those enablers of the two concepts that play role in the relationship and that need to be given due attention to answer main research question #2. Hence, if relationships between the enablers of the two concepts can be sustained by assuring existence of the respective enablers, it is more probable that e-government success and sustainability can be attained.

#### **4.3.2 Type of Case Study Research**

In order to address our case study research questions, exploratory case study was used. First, the relative availability/presence or unavailability/absence of the success/sustainability variables (extracted from literature and presented in Fig. 3.1) in the success or failure designated districts was checked. Then, the relationship between the variables of the two core concepts were explored. Benbasat, et al (2002) characterize most IS case studies as exploratory in nature. An exploratory case study is aimed at defining questions, constructs, propositions or hypotheses (Yin 1993).

#### **4.3.3 Case Selection**

Purposive sampling approach has been chosen for the study and the selection of the cases has been done in such a way that the cases can provide relevant and detailed information in order to answer

the main research questions of the study. As Yin (2009) proposes, there are two criteria for selecting potential research sites. First, sites where similar results are predicted may be used as ‘literal’ replications. Second, sites may be chosen for ‘theoretical’ replication (chosen such that contradictory results are predicted). These two criteria are used in selecting our sample districts. Two sample districts are considered based on the first criteria and two categories of samples created based on the second criteria. Accordingly, sample of four typical districts are selected (Lasta & Sekla districts from Amhara Regional Government and Damot-Gale & Isara districts from SNNP (Southern Nations Nationalities and Peoples) Regional Governments. Lasta and Damot-Gale districts are selected for their typical success and long-term viability of the e-government services; and Sekla and Isara districts are selected for success and sustainability failures. Both districts were selected up on the recommendation by the concerned management in the regional ICT agencies in the two regional governments.

Accordingly, multiple-case study design is adopted. As Benbasat et al. (2002) points, multiple-case designs are desirable when the intent of the research is description, theory building, or theory testing. When multiple cases are included in a study, choices must be made carefully (Benbasat et al., 2002). In line with this, though there are more than seven hundred woredas (districts) in the country of which only four woredas<sup>2</sup> (districts) were considered for the study. In this study our goal is not the representative capture of all possible variations, but to gain a deeper understanding of analyzed cases and facilitate the development of analytic frame and concepts. In our research, the representativeness of concepts, not of sample is crucial because our intended aim is mainly to

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<sup>2</sup> Woreda means District in local language.

construct a theoretical explanation by specifying the conditions and processes that give rise to the variations in the phenomenon under consideration.

#### **4.3.4 Constructs of Interest and Indicators**

Dube & Pare (2003, p. 621) pointed out that “Exploratory case researchers must continue to define a priori constructs in order to help them make sense of occurrences, ensure that important issues are not overlooked, and guide their interpretation and focus when conducting theory-building research”. Accordingly, the constructs of interest were identified based on the literature review (see Figure 3.1) conducted in the previous chapter (chapter three) and each variable is further operationalized to make it observable in the ground (see appendix I for details).

#### **4.3.5 Admin Processes Impacted by WoredaNet Services**

An e-government service can have two forms: either it can fully replace the actual government admin process (eg. online registration system); or it can mainly serve as interface to the admin processes making the actual processes hidden at the back. The e-government services considered in this study mainly serve as interfaces whereby the actual government processes use them for better performance. The following three admin processes are the ones identified for this study because they have benefited from the WoredaNet services and are expected to exist in districts considered for this study.

- a. **Judiciary (court) process:** The process most importantly utilizes the video conferencing service to provide online court service between geographically remote

- (distant) locations. The citizen with court cases is not required to physically come to the place where the judges reside. Instead he is put online through the video conferencing service to hear and act on his cases.
- b. **Human Resource management process:** This process most importantly utilizes the messaging as well as video conferencing service. The messaging service is used to instantly send office memos and directives to those who need to be addressed. Whereas the video conferencing service is used to facilitate different capacity building trainings both locally and from higher government organs.
  - c. **Finance management process:** This process mostly uses the Internet (e-mail) service to access national finance Management System known as IBEX. Besides, the process uses e-mail service for sending and receiving process-related information and reports to and from higher administrative units such as Zonal Finance department.

#### **4.3.6 Stakeholders**

Stakeholders related to the admin processes in focus were identified based on their roles in the process. Accordingly, process owners, WoredaNet service users within a process, and IT support staff were the key stakeholders to be considered. Accordingly, three process owners from each of the four districts (total 12 informants); three experienced service users from each of the four districts (total 12 informants); one IT support staff from each of the four districts (total 4 informants); district administrator (or representative) from each of the four districts (total 4 informants) were selected. Selection of the experienced service users from each of the four districts was done up on the recommendation from the process owners of the respective process under consideration. This makes total of 32 interviews in the four districts. Besides, the in-depth

interview was supplemented by document review such as using memoranda, project documentation, and other documents such as annual reports, and audio/video records.

#### **4.3.7 Analytic Tool**

From the interpretive studies point of view, there are three distinct uses of theory: as an initial guide to design and data collection; as part of an iterative process of data collection and analysis; and as a final product of the research (Walsham, 2002). Structurational model of technology (an extension model of Structuration Theory of Giddens, 1984) was used in this research as analytic tool during the data collection and analysis. This is because as Orlikowski (1994) argues, some previous studies assumed technology to be an objective, external force that would have deterministic impacts on organizational properties such as structures and still other studies focused on the human aspect of technology, seeing it as the outcome of social action; however she points that it is important to take both perspectives into account in order to study technology and organizational structural formation. This model helped us figure out the interplay between organizational formation and technology formation by helping us understand how technology affects and is being affected by institutional properties over time.

Figure 4.1 summarizes the whole process of this research considering the items discussed in section 4.3.

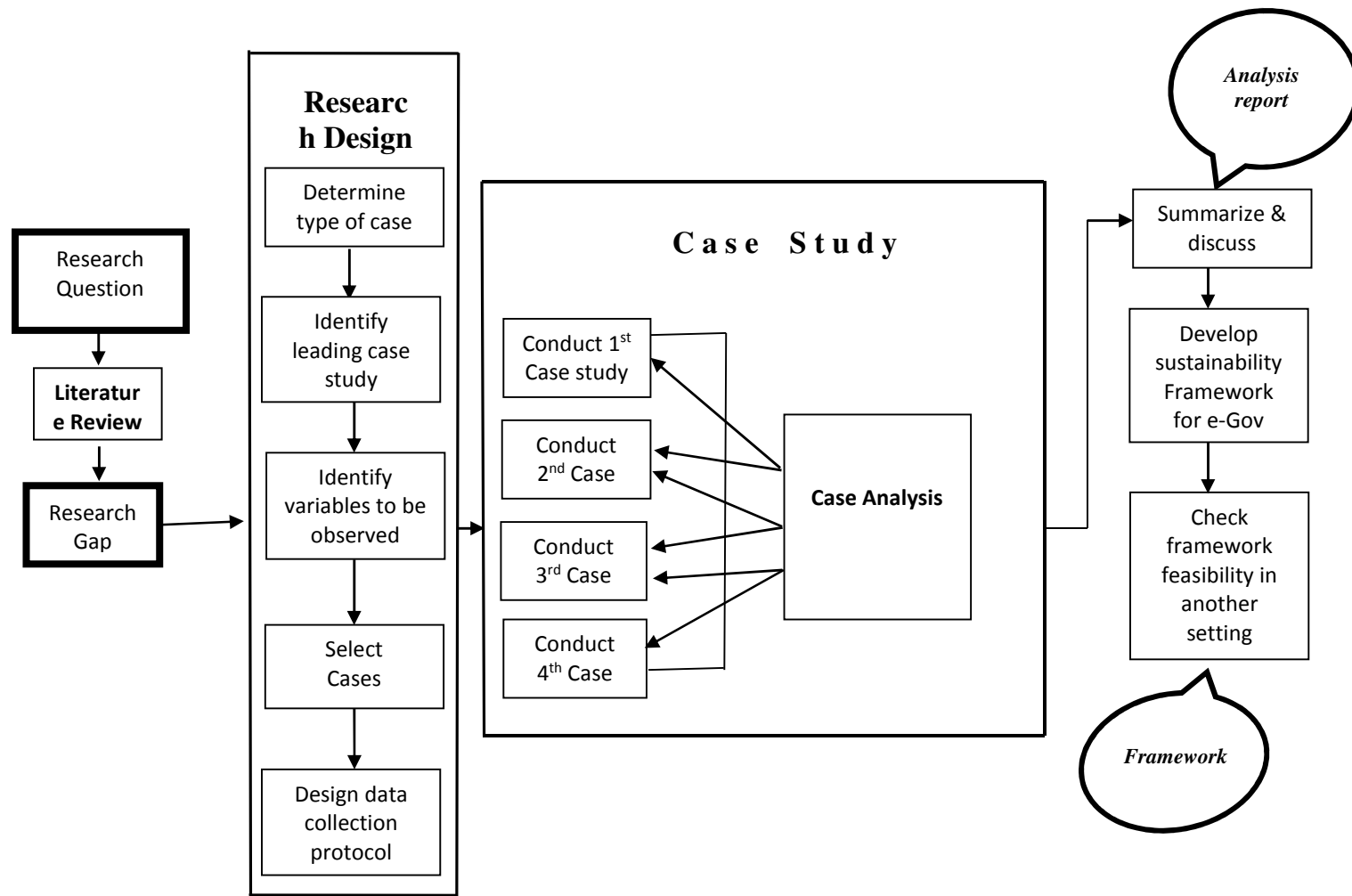


Figure 4.1 Process of the research

Figure 4.1 summarizes the way how this research is designed starting from the main research questions all the way to the proposed sustainability framework which is the final deliverable of this research ultimately. Accordingly, research questions are forwarded at the beginning based on the research problem. Then, comprehensive literature review is conducted to show that there exists gap in theory to explain e-government success and sustainability phenomenon in the ground in an integrated manner. Following the literature review, a theoretical research framework is selected and case study questions were set to guide the data collection and analysis. Before the actual data collection, issues such as determining type of case study, identifying the research variables to be observed, selecting cases (districts), identifying study subjects, and designing data collection protocol based on the identified variables were conducted. Next, the case study is conducted, the collected data is analyzed, and the findings discussed. Finally, sustainability framework for e-government success is developed, its feasibility checked in another related setting, and the components of the framework presented.

## **4.4 Research Techniques**

This section focuses on the data collection techniques, the logic linking the data to the proposition, and the criteria for interpreting the findings.

### **4.4.1 Data Collection Techniques**

As discussed in section 4.1, we have adopted an interpretive approach due to the nature of our research question and the fact that we relied on the perception of the actors in the research setting.

In addition, the study is mainly exploratory by its nature. As a result, we have adopted a qualitative inquiry strategy. Qualitative research seeks to describe and analyze the culture and behavior of humans and their groups and it relies on flexible and interactive research strategy such as interviewing and focus group discussions (Orodho & Kombo, 2002). Case study is one of the qualitative methods often used in information systems research and it helps examine phenomena in a natural setting (Dubé & Paré, 2001).

As Yin (2009) argues, evidence for case studies may come from six sources: documents (written materials ranging from memoranda to newspaper clippings to formal reports), archival records (organization chart; service, personnel or financial records), interviews (open-ended or focused), direct observation, participant observation, and physical artifacts (devices, outputs, tools). However, interviews are the primary data source since it is through this method that the researcher can best access the interpretations that participants have regarding the actions and events which have or taking place, and the views and aspirations of themselves and other participants (Yin, 1984). In our data collection endeavor, documentation, archival records, and physical artifacts were used as sources of evidence in addition to the face-to-face interviews. As Benbasat et al (2002) points using multiple methods of data collection offers the opportunity for triangulation and lends greater support to the researcher's conclusions.

Both primary and secondary data were collected in relation to the WordaNet project and the services in it. The interview data came from detailed interviews with district administrators, process owners, service operators, and the users of the e-government services. To effectively capture people's interpretation, the interviews will be tape-recorded on consent from the

interviewee. Amharic (official language of the nation and the two regional governments) was used for the interviews sessions. The Amharic field notes were subsequently be translated into English. The semi-structured in-depth interview was supplemented by observation, document review such as using memoranda, organizational charts, project documentation, and other documents such as annual reports.

Confidentiality of the collected data and benefits of the research to the organization are two key points to gain cooperation from the study subjects (Benbasat, et al (2002). In line with this, assurance was provided that identities of study participants will not be identified and each participating organization will be provided feedback for future improvement once the study is completed.

#### **4.4.2 Case Study Analytic Strategy**

Analysis of evidence is one of the least developed and most difficult aspects of doing case studies (Yin, 2009). To ease the analysis of case study evidences, having a general analytic strategy and an analytic technique (to be used as part of the general strategy) is most important (Yin, 2009). There are two general analytic strategies forwarded by Yin (2009): relying on theoretical propositions and developing a case description. The former strategy is about following theoretical propositions that have formed the design of the case study and thus helps to focus attention on certain data and to ignore other data; and the latter is about having a descriptive framework for organizing the case study where the analysis is organized on the basis of description of the general characteristics and relations of concepts. In addition, the analytic techniques that can be used as

part of the two general strategies are pattern matching, explanation-building, and time-series analysis (Yin, 2009). Case study description was used as general analytic strategy for this research.

According to structuration theory, there exists a recursive, reinforcing relationship between structures and people's actions or behaviors. Therefore, in analyzing the data, our focus was understanding how the new system was developed and introduced to the prevailing institutional setting and how it affected and being affected by institutional context as well as the perceptions and actions expressed by stakeholders at different administrative levels. This eventually helped us have deeper understanding into the enablers and/or barriers/challenges to the success and sustainability of e-government services.

As also revealed in our literature review, the two concepts (e-government success and sustainability) are related to each other through IT-enabled administrative processes. Hence, the starting point for our analysis of the empirical data was developing deeper insights into the challenges of success and sustainability of e-government initiatives, the conditions that influence sustainability of such e-government initiatives and how existing challenges could be addressed. We started with the analysis of data related to the design, development and implementation of the existing e-government initiatives. By doing so, we tried to relate or map the existing facilitators and challenges to the sub-concepts of the two key concepts. This was done based on facts as how the institutional/organizational context helped or constrained the execution of e-government services and in turn as how the newly introduced e-government services helped or constrained organizational formation.

Our data analysis included two stages: analysis of individual cases independently and cross-case analysis for similarities and differences of evidences among the four cases. To ease these two levels of analysis, the collected data was grouped into four, one for each case. Next, the raw data in each group was sorted, simplified, and organized to reduce the data to ease understanding. Then, the simplified and organized data was carefully read in order to highlight key phrases that are related to the constructs and variables. After the key phrases are figured out in relation to the variables considered, within-case and cross-case analysis were conducted.

The within-case analysis helped us understand each case independent of other cases. Case description strategy and explanation building technique helped us come up with empirically based relationships between the variables explaining the two core concepts of the study. Interpretation was facilitated by visually displaying the relationship between the findings in each case. After having an idea regarding the general context of each case, and the favorable or unfavorable conditions that contributed to the phenomenon in the context of each case, a cross-case analysis was be conducted.

The cross-case analysis helped in understanding the similarities and differences of the four cases. Studying and comparing multiple cases with varying experiences helps strengthening the final conceptual framework by checking for any literal replication (similarities) and theoretical replication(different/contrasting results) (Yin, 2009). Hence, the simplified set of data for the variables of the core concepts of the study were eventually reviewed to find out any relationships and ultimately helped us develop the e-government sustainability framework.

### **4.4.3 Framework Development Procedure**

The following are briefly the key activities in developing and checking validity of the sustainability framework for e-government. First, data will be collected on the e-government services from the four districts (in the two regional governments) based on the indicators of sub-constructs identified. Next, potential relationships will be explored among the enablers of the two core concepts based on the empirical data and an initial sustainability framework was proposed based on the possible relationships among the enablers of the two core concepts. Finally, the validity of the resulting sustainability framework will be checked through a G2C e-government case named ‘Court Case Management System’ at Federal Supreme Court of Ethiopia.

### **4.4.4 Research Validity and Reliability**

Confidence in the data collected and trust in the successful application of the study results are major concerns for any researcher. This issue is more challenging for qualitative researcher because there is risk of researcher subjectivity when collecting qualitative data (Yin, 2009).

Yin’s (2009) criteria for case studies and tactics are adopted in this research. There are four key measures that are generally used to ensure validity and reliability in qualitative research: reliability, construct validity, internal validity, and external validity (Yin, 2009).

Reliability is about ensuring the ability to replicate the research by applying its operations and procedures and achieve similar results (Yin, 2009). Utmost effort was exerted to make presentation of the findings according to the logical flow of the research in such a way that one can depict how

the evidences contribute to the overall argument of the research. This is important as Yin (2009) points that clarity in presentation regarding derivation of chain of evidence from initial questions to the conclusions of the study. Benbasat et al (2002) on his part believe that a clear description of data sources and the way they contribute to the findings of the research is an important aspect of the reliability and validity of the findings. Hence, the reliability of our research was further attained by using interview protocol, tape-recording the interviews, maintaining a documentation of case evidences and findings.

Construct validity is about ensuring that bias and subjectivity are limited throughout the research. The construct validity was assured by using multiple sources of evidence, and having interviewees review interview transcripts. Internal validity reflects the extent to which causal relationships could be established (Yin, 2009). To that end, within-case analysis followed by cross-case analysis and explanation building was used. Besides, triangulation during data collection was applied. External validity assesses the analytical generalization of the research findings (Yin, 2009). In this research, external validity was maintained by using replication logic in our multiple cases.

In addition, set of principles proposed by Klein & Myers (1999) for conducting and evaluating interpretive field studies in information systems (see table 4.1) were considered. The set of principles are: (1) the hermeneutic circle – the researcher iterates between the interdependent meaning of parts and the whole that they form; (2) contextualization – the researcher decides what relevant context(s) should be explored; (3) interaction between the researcher and the subject – when it comes to how the data are going to be created in relation to the subjects; (4) abstraction and generalization – what theories or concepts will be abstracted and generalized; (5) dialogical reasoning – when the researcher’s own intellectual history is an issue; (6) multiple interpretations

– if it requires the researcher to examine the influences of social contexts and document the multiple views of ‘stories’; and (7) Suspicion – when the aspects of reality are presented in order to formulate research questions critically.

**Table 4.1** Summary of Principles for Interpretive Field Research (Klein & Myers, 1999, p. 27)

<b>Summary of Principles for Interpretive Field Research</b>	
<b>1. The Fundamental Principle of the Hermeneutic Circle</b>	This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.
<b>2. The Principle of Contextualization</b>	Requires critical reflection of the social and historical background of the research setting. So that the intended audience can see how the current situation under investigation emerged.
<b>3. The Principle of Interaction Between the Researchers and the Subjects</b>	Requires critical reflection on how the research materials (or “data”) were socially constructed through the interaction between the researchers and participants.
<b>4. The Principle of Abstraction and Generalization</b>	Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.
<b>5. The Principle of Dialogical Reasoning</b>	Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (“the story which the data tell”) with subsequent cycles of revision.
<b>6. The Principle of Multiple Interpretations</b>	Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.
<b>7. The Principle of Suspicion</b>	Requires sensitivity to possible “biases” and systematic “distortions” in the narratives collected from the participants.

This research was undertaken considering the set of principles outlined in table 4.1 because the principles are aimed at improving the believability and intensity of the research; and they further exhibit the quality expected of an interpretive case study.

## **4.5 Chapter Summary**

In a research practice, research design is crucial in that it services as a bridge between the initial research question to the data to be collected and conclusions to be drawn. Chapter four has presented details of our research approach focusing on the philosophical foundation and our methodological choices. Accordingly, in order to realize the research objective and answer the corresponding research questions, it is argued that interpretive philosophical stance together with an exploratory case study approaches is found more appropriate. Then, the case study design and research techniques are presented in detail. By so doing, this chapter facilitated the precondition to the next chapter. The next chapter (Chapter Five) presents the actual process of the data collection, its analyses and the findings in light of the strategies that were outlined in this chapter.

## **CHAPTER FIVE: THE CASE STUDY**

The Case Study chapter details the process, results and discussion of the results of the field work (case study). First, it gives an overview on WoredaNet and research environment investigated. Then it details the process and results of the research activity in field. Finally, discussion of the findings are presented in which the potential relationships among the enablers of the two core concepts were explored based on the empirical data (results).

### **5.1 Introduction to WoredaNet Project**

This section presents background information about WoredaNet project; overview of the socio-political context in which the project is deployed; and an overview about the four districts considered for this study.

#### **5.1.1 Socio-political context**

Ethiopia has a federal system of Government with a population of over 73 million according to the 2007 population and housing census of the country (Central statistical Agency of Ethiopia, 2008). Some recent unofficial reports indicate that the population of Ethiopia is over 96 million ([http://www.indexmundi.com/ethiopia/demographics\\_profile.html](http://www.indexmundi.com/ethiopia/demographics_profile.html)). There is a great deal of diversity in the country. The culture and language, for instance, is diverse based on ethnic groups

and it is reported that there are more than 83 different languages with up to 200 different dialects spoken. The largest ethnic and linguistic groups are the Oromo, Amhara and Tigrayans respectively. The geographical situation is also different from region to region and even from district to district in a given regional government. The stability and access to infrastructure also differs from region to region and between urban and rural areas (Takeuchi, 2008).

To address such diversity, the country is divided into nine ethnically-based administrative regions (*kililoch*, sing. *kilil*) which function as autonomous entities. They are subdivided into 68 zones and two chartered cities (*astedader*). It is further subdivided into more than 700 *woredas* and six *special woredas*. Woreda<sup>3</sup> (to mean a district) is an administrative sub-division, or local government equivalent to a district. Since 2002, more authority was transferred from the Regional governments to woredas (Kitaw, 2006).

### 5.1.2 Project History

Funded by the Federal government of Ethiopia, the WoredaNet is an e-government project initiated and governed by the then Ministry of Capacity Building and implemented by the then Ethiopian ICT Development Agency (EICTDA) (now upgraded and renamed as Ministry of Communications & Information Technology). The project aims to build terrestrial and satellite-based network connecting lowest levels of government. It is an example of a Government-to-Government (G2G) model in an African country (Kitaw, 2006). Takeuchi (2008) on his part

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<sup>3</sup> “Woreda” is an administrative division in Ethiopia, equivalent to a district with an average population of 100,000. Woredas are composed of a number of *Kebele*, or neighborhood associations, which are the smallest unit of local government in Ethiopia. The Name WoredaNet comes from “Woreda”.

pointed that WoredaNet is categorized as an e-Administration project which aims to improve work processes in the public offices since e-Administration initiatives are reform initiatives for improving processes that deal particularly with improving the internal workings of the public sector.

The objective of the WoredaNet is to deliver IP based services through the use of broadband terrestrial and VSAT infrastructure. This is part of a broader ICT initiative to promote sustainable development through a massive program of ICT application which is aimed at empowering citizens. The long term objectives include the provision of accurate and timely information to all levels of government; building organizational capacity at all levels of the government; providing knowledge and information to citizens; and bridging the digital divide between urban and rural communities (Kitaw, 2006).

Different services are being provided over the WoredaNet at the federal, regional and woreda level of government. These are video conferencing which is a service that allows meeting and broadcast of recorded sessions and programs to remote woredas; Internet and messaging that is an electronic messaging environment for a free flow of messages through a secure and organized IT framework reflecting the government hierarchical structure; Voice over IP (IP telephony) which is a service that permits common and singular voice exchange over IP communication infrastructure between federal, regional and woreda sites; and web services that are series of web servers and pages that provide civil servants with access to government restricted information, but also access to content available on the internet on education, health agriculture and governance (Ethiopian ICT Development Agency, 2003). Among the aforementioned services, a highly visible and effectively

used application is the video conferencing service for officials at werada, regional and federal level. The government Video Conferencing solution works over a nationwide IP based video conferencing within Ethiopia between the Federal Government and all eleven regional States and also different regional states and their woredas/districts. More specifically, the Video-Conferencing application for woredas in Ethiopia is aimed at increasing the efficiency of the government at the woreda, regional and federal level as it is planned to allow effective and frequent communication and collaboration between woreda administrators, region heads and the federal government; improve use of executive time (speed up decision making); provision of timely information to the lowest government institutions; and reduced travel and administrative costs for sharing information (Kitaw, 2006).

Regarding organization, WoredaNet is centrally under the direct management of Ministry of Communications & Information Technology (MCIT). The Ministry is responsible to device rules and regulations on how to use the WoredaNet Infrastructure. The WoredaNet consists of National Data Center, regional data centers, and Woreda centers located at the main towns of each woreda. The National Data Center (NDC) is the command post and the heart of the woredaNet where all the services are being provided. The NDC is responsible for centrally managing the WoredaNet, monitoring and supporting the woredaNet infrastructure, coordinate the activities of the regional and woreda data-centers, and provides maintenance and training supports. The Regional Data centers are under Regional ICT Agencies of each region and they are responsible for coordinating and controlling the WoredaNet services in their respective regions and provide over all support to woreda centers with-in their region. At its lowest level, WoredaNet has the Woreda centers (Woreda Sites) at each Woreda, which directly provide services to the users. They provide Video conferencing, internet and other WoredaNet services. These Woreda Centers serve to all

government offices as well as public institutions with in the woreda. In addition to managing the woredaNet services, staffs at the woreda center are charged with the responsibility of providing ICT training to woreda-level government offices (Ethiopian ICT Development Agency, 2003).

### 5.1.3 Overview of Cases

This is a multiple case study in which four districts (in two groups) were considered through theoretical and literal replication (Yin, 2009). Accordingly, the grouping is based on theoretical replication for different results whereas the cases within a group are based on literal replication for related results.

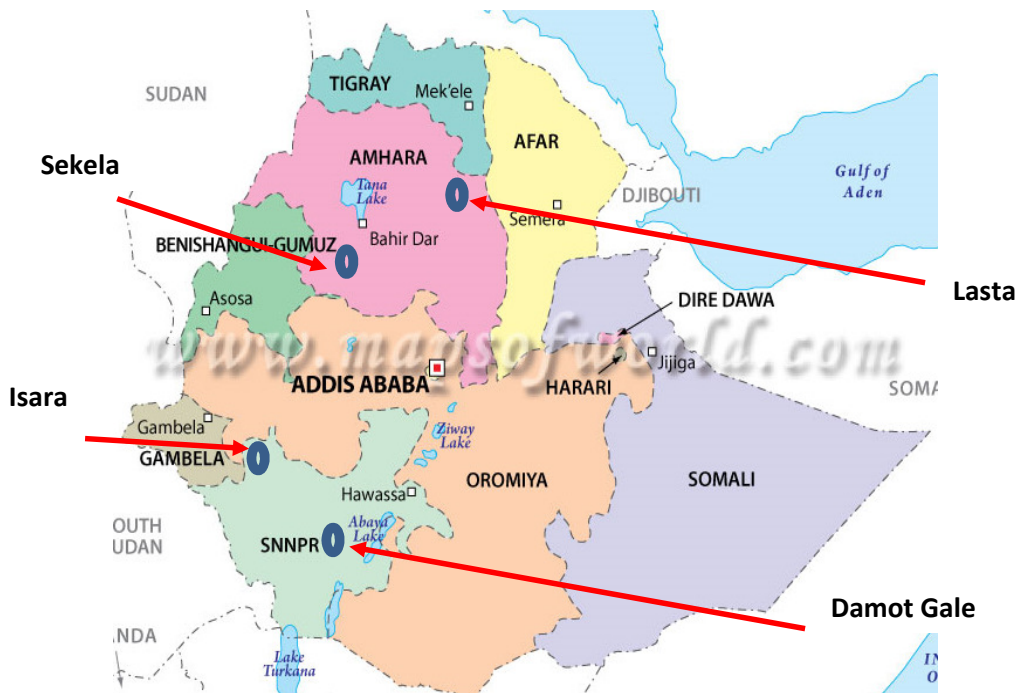


Figure 5.1 Location of case districts on the political map of Ethiopia

#### **5.1.3.1 Lasta District**

Lasta is one of the districts under the Amhara Regional government. The Amhara region occupies the north western, north central, and north eastern part of the country. Lasta district is located to the north eastern part of the regional government under north Wollo zone and Lalibela is its capital. The district's capital is located about 721 kms from the capital Addis Ababa and about 340 kms from the regional capital Bahirdar. According to the 2007 population and housing census of Ethiopia, the total population of the district is about 117,777. The majority of the population in the district are living in rural areas. This district is also known for its tourist attraction. Lasta is a place where monolithic rock hewn churches of Lalibela are situated and several other historic attractions are found. Most local and foreign tourists prefer Lalibela as one of the ideal tourist locations in the country. Most of the population are Orthodox Christians by religion. The land form is more of mountains and gorges and the climate is mostly cold.

WoredaNet is deployed in this district around 2007 and since then majority of the government offices in the district are benefiting from the WoredaNet services. Internet, Video conferencing, and Messaging are the main WoredaNet services operational in the district.

#### **5.1.3.2 Isara District**

Isara is one of the districts under the Southern Nations, Nationalities & People (SNNP) Regional government. The SNNP region occupies the south western and south central part of the country. Isara district is located to the south western part of the regional government and Isara is its capital.

The district's capital is located about 534 kms from the capital Addis Ababa and about 340 kms from the regional capital Hawasa. According to the 2007 population and housing census of Ethiopia, the total population of the district is about 64,950. The majority of the population in the district are living in rural areas. The land form is more of highland with massive forest, the climate is cold and the district gets rainfall most of the months in a year.

WoredaNet facilities are presented to the district around 2008 GC but not yet installed and made functional so far.

#### **5.1.3.3 Damot Gale District**

Damot Gale is one of the districts under the Southern Nations, Nationalities & People (SNNP) Regional government. This district is located to the central part of SNNP regional government and Boditi is its capital. The district's capital is located about 377 kms from the capital Addis Ababa and about 101 kms from the regional capital Hawasa. According to the 2007 population and housing census of Ethiopia, the total population of the district is about 151,079. Majority of the population in the district are living in rural areas. The land form is mixture of both highlands and lowlands with large area of plateau, the climate is moderate and the district one of the highly densely populated areas in the country.

WoredaNet is deployed in this district around 2007 GC and since then majority of the government offices in the district are benefiting from the WoredaNet services. Internet, Video conferencing, and Messaging are the major WoredaNet services being used in this district.

#### **5.1.3.4 Sekela District**

Sekela is one of the districts under the Amhara Regional government. Sekela district is located to the north Western part of Amhara regional government and Gish Abay is its capital. The district's capital is located about 469 kms from the capital Addis Ababa and about 174 kms from the regional capital Bahirdar. According to the 2007 population and housing census of Ethiopia, the total population of the district is about 138,691. Majority of the population in the district are living in rural areas. Most of the population are Orthodox Christians by religion. The land form is mixture of highland and lowlands with moderate climate and couple of potential tourist attraction sites among which is the source of Abay (the Blue Nile). WoredaNet facilities are presented to the district around 2007 GC but not yet installed and made functional.

## **5.2 Process of Research Activity in the Field**

Chapter four previously detailed on the case study research design, the research techniques, and procedure to be adopted in order to maintain the reliability and validity of the study. Based on the plan in chapter four, this section presents the actual research activity conducted in the field as per the case design and research method presented in the previous chapter and especially the steps followed in the qualitative analysis of interview data.

### 5.2.1 Data Sources and Collection

ICT Agencies of the two regional governments identified for the study were first visited in September 2011 in order to discuss with the top management of the Agencies about selection of two cases (districts) from each region. Accordingly the researcher presented the general requirement for the selection. As this study mainly relies on the perception of the stakeholders, selection of the cases was done by the management of the ICT agencies of respective regions. Selection of the four cases (Lasta, Sekela, Damot Gale, and Isara districts) was based on the literal and theoretical case replication logic discussed in section 4.3.4. Besides, three admin processes were considered in each of the four districts. These were: Human Resource management process, Finance management process, and Judiciary (court) process. Following the selection of the four cases, two of the four research sites (Lasta and Isara districts) were visited for the first time in January 2012 for first-hand data. However, the main data collection was conducted in the four districts from November 24, 2014 – January 16, 2015. Interview was the primary data collection tool used.

Prior to the actual interview, copy of the interview protocol was given to each interviewee for him/her to get prepared on the issues. In addition, brief introduction about the purpose of the study was given for each interviewee and all respondents were confirmed that whatever they express as response will be used for only the purpose of this study and will not be consumed for any other purpose. Respondents were assured in advance that their feedback will be confidential and were told that their personal identities are not required during the interview session. The assurance was provided to each interviewee that the district and its employees will not be harmed by its

participation and the researcher confirmed that each participating district will be provided feedback at the end of the study for future improvement. An agreement was also reached with each interviewee to only express what s/he feels and free to abstain to a question if s/he is not comfortable to respond to.

Data was collected using primary sources. The interview questions were semi-structured in order to help the respondents express their feeling freely in their own way. Indeed, the face-to-face interview was guided by a list of questions prepared in advance and presented in person to each interviewee a day or two before the actual interview with each respondent. Interviewees were identified based on their roles in the admin processes. Primary data sources included face-to-face semi-structured interviews with key informants of the study were district administrators, process owners, service users, and IT support staff. Initially it was planned to consider, three process owners at each of the four districts (total 12 informants); three experienced service users at each of the four districts (total 12 informants); one IT staff at each of the four districts (total 4 informants); and district administrators (or representatives) at each of the four districts (total 4 informants). Besides, about 5(five) interviews were planned at Federal Supreme Court where feasibility<sup>4</sup> check was planned. This makes total of 37 face-to-face interviews. In actual sense during the field work, total of 36 (thirty six) planned interviews were carried out on site each lasted for an average of 35 minutes. Eight /8/ interviews were conducted at three research sites (namely at Damot Gale, Sekela, and lasta) and seven /7/ interviews at Isara because though initially planned

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<sup>4</sup> In this research, framework feasibility is to mean practicability or practical application of the framework in another related setting. For instance, Dzhusupova, et al. (2011) developed an e-Government framework and presented the experience of its practical application in Afghanistan. Similarly, Ashaye (2014) proposed a conceptual framework from literature and tested it by carrying out a qualitative analysis using a case.

to make face-to-face interview with the ICT unit coordinator, there was no ICT staff in this district. Ultimately, framework feasibility was checked at Federal Supreme Court of Ethiopia where a G2C e-Government named ‘Court Case Management System’ was put in place and operational over a decade. At Federal Supreme Court 5 (five) formal interviews were conducted out of which one interviewee was not willing for his voice to be tape-recorded. Accordingly, 35(thirty five) out of 36(thirty six) formal interviews were tape-recorded and documented for research consumption and future reference.

Up on the consent from the study subjects, voices of the interviewees was tape-recorded with the intention to catch most of their perception and as an evidence to keep for future reference. Field notes were taken by the researcher during the interview sessions and each interview lasted on average for about 35 minutes. Subsequently the audio recorded interview data was transcribed (written out) in Amharic and presented to the informants for review. The purpose of this review was to let them assure that what is documented is what they actually told the researcher during the interview session. Inputs during this review were reconsidered and the analysis effort commenced. The interview was conducted in Amharic (which is working language of the federal government) and was supplemented by documented sources in the form of internal reports, newspapers, technical documents, video documentations, etc. from one of the research sites.

Due to their limited size and scope, those pieces were labeled as supplement of the interview transcript. For instance, the newspaper state that the district has shown significant progress in relation to the use of WoredaNet services as best performing district in the region. Similarly,

couple of video recordings indicate trainings conducted at different times as capacity building for the civil servants as well as official visits by officials from the regional and federal ICT bureaus.

### **5.2.2 Validity and Reliability of the study**

As discussed in chapter four, confidence in the data collected and trust in the successful application of the study results are major concerns for any researcher. This issue is more challenging for qualitative researcher because there is risk of researcher subjectivity when collecting qualitative data.

Clarity in presentation regarding derivation of chain of evidence from initial questions to the conclusions of the study was given due attention in the course of the research. In line with this, interview protocol (see Appendix III) was used to guide each interview. The interview protocol was derived from the concepts, constructs, variables and indicators all based mainly on the literature review conducted in Chapter three. Besides, all secondary documents collected and the audio records of the interview session including the field note by the researcher during the interview session are maintained as a documentation of case evidences.

Construct validity is about ensuring that bias and subjectivity are limited throughout the research. To maintain the construct validity, it is tried to use multiple sources of evidence. Accordingly, primary and secondary sources are used as source of data, observation made by researcher, and different stakeholders considered. Then, effort was made to establish chain of evidence among the

data collected. In addition, interviewees are made to review interview transcripts in relation to the information they have provided.

Internal validity reflects the extent to which causal relationships could be established. Regarding internal validity, within-case analysis was done in order to understand the reality within each district independent of other districts considered for the study. Then, cross-case analysis was done to understand the phenomenon in a wider perspective for broader picture. These were done by explanation building technique. Besides, triangulation was done during data collection.

External validity assesses the analytical generalization of the research findings. In this research, external validity was maintained by using replication logic in our multiple cases. This is a multiple case study in which two sets of districts were considered for the study. The category was based on theoretical replication for different results whereas the cases within a category were based on literal replication for related results.

Besides, an attempt has also been made to apply about four of the seven principles of Klein & Myers (1999): (1) the Fundamental Principle of the Hermeneutic Circle; (2) the Principle of Contextualization; (3) the Principle of Abstraction and Generalization; and (4) the Principle of Multiple Interpretations. In relation to the Fundamental Principle of the Hermeneutic Circle, we have tried to move back and forth between the with-in and cross-case data in order to derive meaning out of it. As to Principle of Contextualization, we recognized that stakeholders' response during the field work was highly influenced by the socio-historic context they belong to. That in turn helped us associate our interpretations in light of the socio-historic context of the respondents.

Regarding the Principle of Abstraction and Generalization, our study tried to explore as to how the relationship between the two core concepts (e-Government success and sustainability) is formed and what it consists of. Although the empirical data we used to substantiate or demonstrate the result is from Ethiopian context, our research question is not specific to Ethiopian context. Hence, the research contribution is generic and not specific to the Ethiopian context. Finally, the Principle of Multiple Interpretations is considered in our study in that the study mainly depended on the perception of the stakeholders. In that case possible differences in interpretations among the participants are expected and interpretations of the stakeholders considered as happened.

### **5.2.3 Data Analysis**

Based on our data analysis strategy in section 4.4.2, the activities performed and procedure followed in the qualitative analysis of interview data were briefly presented as follows.

First, interview transcript was prepared primarily based on field notes and audio records of interviews. In addition, annual reports and video documents from the study site were considered. Then, relevant pieces were labeled in the interview transcript. Accordingly, relevant words, phrases, sentences, or sections were labeled or coded. Such labels were about actions, activities, concepts, differences, opinions, processes, or other items that are found relevant. The relevance of those items was based on different criteria: some are considered because of their repetition in several places; others considered because the interviewee explicitly states that it is important; still others considered because they have surprised the researcher because of their unique feature. Preconceived concepts were used for the labeling or coding and the labeling. Then, most important

codes were figured out and categories created by bringing related codes together. The write-up of the results is done ultimately.

Structurational model of technology was used as an analytical tool to help us view the data as how institutional properties facilitated or constrained the implementation and use of the technology and vice versa. Accordingly, the theory was used as a supporting guide in the process of data collection and analysis. Using the theory as our theoretical foundation to guide our understanding of the problem at hand, our aim has been further exploring as to how the relationship among the institutional, environmental, administrative, and technological factors/properties happen.

### **5.3 Results**

This section presents the findings of our study based upon the methodology we applied to gather information. An introductory context is given for understanding the results by restating the research problem underpinning our study followed by a summary of the key findings. The construct of interest and the indicators identified in section 4.3.5 (based on literature review) guided the presentation in this section. This section presents what is actually obtained doing the data collection, data analysis, validity and reliability. It describes the findings using the neutral voice, and do not interpret results. The results are presented into two sub-sections: within-case and cross-case basis.

### 5.3.1 With-in case Findings

The within-case analysis helped us understand each case independent of other cases. For each case, presentation of the findings is made based on the order of the leading case study question in section 4.3.1 and respective variables sought important in the relationship of the core concepts.

#### 5.3.1.1 *Lasta*

Process owners of selected admin processes in the district reflected on the performance of admin processes after they are being enabled by WoredaNet services in focus. For instance, the district used the video conference service of the woredaNet to conduct experience sharing workshops with other districts (woredas) as well as zonal and regional government units. The video conference service has facilitated provision of timely information to other administrative organs and reduced travel and administrative costs for sharing information and increase collaboration among government institutions. This has helped improve the efficiency of the admin processes in the district by allowing better use of executive time and speed up decision making and also contributed to improve the capacity of government institutions to provide better services to citizens.

More importantly the video conference service is used for court hearings held at the Federal Supreme Court, as well as region and zonal-level courts. Structurally the Ethiopian Courts are arranged hierarchically from the lower structure woredas to zone, region and the federal government level. Based on the types of the issue, these courts give services to citizens. Providing Court services using video conference has helped citizens by avoiding travel from district to zonal and regional centers and the capital Addis Ababa. Instead of traveling long distance, citizens can

use the video conference services of the WoredaNet near his/her home town to attend the court conducted at a zonal, regional center or Addis Ababa. This has helped citizens to avoid inconveniences and unnecessary expenses as well as to get faster responses for their cases.

Various sectors in the district also became users of internet (e-mail) services through the WoredaNet. The district's administrative organs use the e-mail services to communicate reports and exchange information with other parties. Previously, official reports would take couple of days to reach from districts to regional capital and then to the federal ministries. Thanks to the e-mail service by the WoredaNet that the problem is reduced greatly. In general, the e-mail services by the WoredaNet have contributed for efficient communications among tiers of government which in turn has contribute to administrative reform and better services to citizens.

As a result of the benefits presented above, the district administrator and process owners perceive that WoredaNet is successful in their district. As to the criteria for their evaluation, they raise economic benefits followed by political, institutional, and technological benefits. Economically, the WoredaNet services help produce required output at minimum resource cost. This is in terms of communication cost, training cost, travel cost, stationary cost, labor cost as well as processing time. Previously, tasks were not performed as per requirements from the higher government organs. This was accounted to long travel distance between the government organs; citizens and government units located in a geographically dispersed location; and lack of land transportation mechanisms due to difficult land form, and also due to lack of sufficient financial resources both at government departments and more importantly among citizens. Socially, the WoredaNet services brought better access to knowledge, improved capacity building opportunity, and better

social communication. The WoredaNet services brought improved citizen's perception on government by making government services accessible to citizens. For instance, the court hearings through the video conferencing service reduced the previous time taking court process which the respondents claim as corrupted one. Besides, the difficult land form and limited access to transportation in most of the rural areas added the value of the video conferencing service among citizens. There are also institutional factors based on which the informants evaluated the success of the WoredaNet services. In this regards, the WoredaNet services improved decision making practice at different levels; and increased employee's participation in organizational communication. The introduction of WoredaNet services brought more autonomy and responsibility to employees by allowing them perform most of their activities without support from other parties. As these services enhanced communication among the stakeholders, they have enhanced stakeholders' involvement in organizational matters. The use of these new services required alignment with the changing environments (eg. user skill enhancement). Besides, they have brought changes in organizational rules and regulations. Technologically, they have improved degree of connectivity of the new system across government departments.

The frequently stated factors contributed for the success and sustainability of the WoredaNet in Lasta district from stakeholders' perspective have been:

- Short-term awareness and skill trainings have been organized and offered by ICT unit at different times for the management and mainly for the civil servants of different sectors of the administration. Most of the trainings were organized based on prior need assessment by formally distributing requirement identification questionnaire to different

administrative units. Training manuals were provided to trainees during the hands-on training session.

- Top management has been positive towards issues being raised in relation to ICT. They are willing to cooperate with ICT unit in matters pertaining to the unit. The political leaders took a leading role in promoting the technology to the middle level management and the civil servants as a whole. They were willing to listen matters arising from the ICT unit and consider ICT-related issues as one of the key agendas that need due attention. Although the top management is highly engaged on political matters, their commitment is also expressed through their effort to attend trainings organized by the ICT unit and also allow their subordinates to attend same as per a training schedule by the ICT unit. They have served as change agents and actively involved in the project since its conception, and same continued afterwards.
- The district administration has positive working relationship with ICT staff and motivate them through different means. Money and laptop prizes were given to the ICT unit coordinator for his outstanding performance. Besides, the district administration provided sponsorship for the ICT unit coordinator to attend further university education during summer.
- The ICT unit is recognized by the top management as one of key sectors for the district. As a result, the unit is represented in the management committee. The ICT unit coordinator is member of the management committee in which heads of different departments under the office of the district administration are part. The management committee is a higher body that discusses and proposes solutions on different vital matters such as budget and

other resources. So, this representation allowed the ICT unit to raise key issues pertaining to the unit and get issues discussed and decided. Besides, top management periodically evaluates performance of the WoredaNet centers with an intention to identify and understand shortcomings and make interventions improve same.

- The commitment from the ICT staff to share their expertise and their unreserved performance exerting full capacity and their success in practically showing the WoredaNet in operation has in turn influenced the top management and other staff to cooperate with the ICT unit.
- ICT's positive impact in previous change and development efforts such as Business Process Re-engineering (BPR) which was implemented prior to the WoredaNet project has influenced the awareness and attitude of the management and civil servants on the value of ICT.
- Lasta district is repeatedly identified by the regional government as one of districts with outstanding performance in different change and good governance initiatives. Having such success stories in turn brought more financial and technical support as well as close follow-up of activities from the regional government. This is because the government wants to keep best performing districts and tries to use them as a model to extend those best practices among other districts as a strategy to implement government development efforts. Through time the district administration built a sense of maintaining success in any development effort and this became shared vision of everybody in the district.
- Lasta lalibela is one of the popular tourist destinations in the country. This has created an opportunity for citizens to get familiar with state-of-the-art ICT equipments the tourists

bring during their visit. This access to the technology motivated the citizens get inclined to the technology and influenced their attitude to own and use the technology. This also created opportunity for young entrepreneurs to open Internet cafés in the town to let the tourists and residents have access to the technology. The prevailing communication culture is also influenced due to the nature of tourist industry. Especially those citizens who make their lives serving tourists need to have frequent communication with local partners and tourists. This in turn created good information sharing and communication culture among the citizens and the technology is found best solution to facilitate same. So everybody is willing to learn the technology and apply as well. These opportunities raised interest of the community to own and use the technology.

- WoredaNet is a national project initiated by the federal government of Ethiopia and rolled top-down to regional governments and then to districts. According to its top down organization, there is working relationship among the three levels of government and each of the three tiers of government has its role and responsibility in the proper operation of the WoredaNet and its services. Among other things, source of budget for WoredaNet ICT unit has not been defined and is left to districts to decide on their own. To address these challenges, Lasta district's top management tried to fulfil financial requirements by shifting budget from other administrative budget sources and availed other resources as required. Worth to mention, there were changes of position holders among the top management but the successors have kept supporting the new services with optimal caliber. Such internal measures helped the ICT unit to self-sustain and helped the unit to execute activities and keep the WoredaNet services up and running.

- Lasta district has prior successful change management experience. They have been handling change initiatives in an organized manner. The district administration gave due attention for creating awareness among the top management about the change initiative and take time to let the management own the change effort through series of discussions. Then, the management plans as how to go for the implementation and make ready other requirements such as budget, human resource, space, time, and other resources. The top management plays a leading role in the implementation process of any change initiative and provides immediate response to challenges in the course of the implementation.
- Civil servants practice of using ICT to perform their day to day activities is included as evaluation criteria in employees appraisal form. Hence, employees give due attention to upgrade their performance through use of the technology and use of WoredaNet services has been part of their daily routine for most of the sectors. Practice of sharing their knowledge and skill (in relation to the technology) to their colleagues is also promising. The influence from the top management and ICT unit in creating this practice was magnificent. The top management has a crucial role in shaping the organizational culture through their actions, interventions, and directives to improve use of the new services and the technology as a whole. In this district, there is open culture that promote learning, transparency, knowledge and information sharing, collaboration and cooperation among the community and thus everybody feels as a family.
- Once the awareness is created about a change effort among the civil servants, they did not wait for the management to execute it. The top management and the ICT staff were the ones who play significant role during the implementation of WoredaNet to actualize the project. Whenever there is service interruption, the civil servants actively push the top

management and the ICT unit to reinstate the services. The civil servants do not want the services interrupted because they have noticed the benefits. They care for the technology and recognize that it is put in place to facilitate their activities. There is intimate relationship between the top management and civil servants. Apart from passing directives to subordinates and units, the top management try to come close to the civil servants to experience what is happening in the ground, share feelings, and discuss issues on spot. Such practice helped the management to promote new things easily among the staff and get their buy-in.

#### *5.3.1.2 Isara*

The WoredaNet is not yet functional in this district. The facilities were presented to the district around 2006/07 at the time when WoredaNet project was rolled out to districts all over the country. The sectors (admin units) have not experienced the benefits of WoredaNet so far. In the interview with the administrator of the district (top political leader in the district) and process owners confirmed that the technology is not availed to the users so far and they only know by name and heard that facilities are kept in store. Unanimously the stakeholders perceive that WoredaNet is unsuccessful in their district because they haven't benefited from it so far. This is what the researcher has observed actually in the ground. Thus, it was not possible to get facts on how the technology contributed to improve the admin processes in the district.

Informants in this district have raised their perception on possible internal and external reasons that have contributed for the unfavorable situation of the WoredaNet in the district. These factors are presented as follows.

- The top management expressed keen interest to use and promote the WoredaNet but no practical steps taken so far by them to address the challenges and no close follow-up rendered to engage concerned stakeholders to actualize the technology in the district. The effort on the side of the district management to address the problems that hinder the implementation of the WoredaNet has been limited.
- There is big gap in awareness and skill about ICTs among top management and civil servants. No ICT trainings and capacity building activities so far since there is no operational ICT unit that can take responsibility to organize and follow-up same.
- There is an ICT unit in the administrative structure of the district (as the structure is uniform across all districts) but no ICT staff in the district so far. The effort exerted by the administration to recruit and retain ICT professionals was limited. Among others, the remote location of the district as well as its poor infrastructure (such as electricity, telecom, health facilities, etc.) have contributed for unavailability of competent professionals. Still top management believes that it is of no use to recruit ICT staff unless the WoredaNet is put in place.
- There is also no dedicated budget to run ICT activities and the top management is not clear as to how to handle this even when the time comes.
- The project team from MCIT and regional ICT agency left without completing the installation. There is also weak administrative support from the district administration because of lack of awareness among the top management. The technical support rendered from the regional ICT agency has not been satisfactory and timely.

- The experience to manage changes in an organized and formal manner is yet to develop. The effort to lead change activities in an organized way by creating awareness on the change issue and having everybody own and involve in change efforts is at its early stage.
- Because they are not using the WoredaNet services to support administrative processes, using ICT to facilitate administrative activities is not considered as element in the employee appraisal form.

#### *5.3.1.3 Damot Gale*

Informants disclosed that notable values were added to the admin process as a result of the use of the WoredaNet services. Trainings have been conducted through the woredaNet video conference service. The WoredaNet has been used to provide trainings for woreda administrators, public servants, judges and prosecutors. This has reduced costs associated with moving the trainees to a central place. This has also created an opportunity to train many peoples at one time and at a reduced cost. Training public servants using the videoconferencing service has also helped to reduce service shut downs that may result from moving public servants long distances away from their working area for training and in turn contributed to improve the services to citizens.

In addition, informants mentioned about the benefits out of online applications accessible through the WoredaNet such as Integrated Budget and Finance system which is an application by Ministry of Finance & Economic Development. Such on line applications helped the beneficiaries of the output of the admin processes get services that meet their expectation in the format of the deliverable, time of delivery, cost for receiving the deliverables, etc. That way it also helped the

civil servants perform error free tasks by allowing them closely review their work, communicate directly with the recipient, and get confirmation from recipient on receipt. In addition, the amount and frequency of information transfer between departments has increased; it has enhance work moral of the political leaders and civil servants; it has also enhanced output delivery capacity of the civil servants. As a result of the new services, instant communications between parties become possible and instant response to any request from anywhere became possible. As a result of such benefits presented above, the district administrator and process owners perceive that WoredaNet is successful in their district despite couple of challenges faced in the process.

As for stakeholders' perception on the enablers of the long-term success of the WoredaNet in the district, the factors repeatedly stated have been:

- The ICT professionals were recruited since the beginning of the WoredaNet services. Relatively, there is no infrastructure (electricity, road, telecom service) problem. The distance from regional capital is short and the availability of different infrastructure facilitated the effort to get competent staff and retain for long.
- Initially awareness creation sessions were organized by the ICT unit targeting top management (the political leaders) to create awareness and get their buy-in on the value of the technology to promote administrative activities. Although there were number of short-term skill and competency trainings organized by the ICT unit long ago, the majority of the informants stated that those efforts didn't continue. As a result, there exists notable gap in ICT knowledge and skill among civil servants especially the new entrants who didn't benefit from those trainings.

- The willingness on the side of the top management to introduce technology and promote among sectors is high. The top management considers ICTs as crucial enablers to development efforts in other sectors. The management, thus, considers it as a line function and intervene up to the reach of their authority. Whenever there is service cut-off, for instance, they immediately communicate regional ICT agency or other stakeholders in cases where technical support or otherwise is needed. The ICT staff are also provided necessary support to present cases to regional ICT agency when needed to do so.
- The ICT staff and the top management has positive relationship. The management provides budget and other resources required to run ICT activities and also motivate the ICT staff by financing short term trainings and even formal college education in distance basis. The top management formally recognizes the ICT professionals for their performance. Incentives and rewards utilized to keep ICT staff motivated to support and share knowledge to colleagues. Rewards such as prize for work, promotions, additional pay for occasional accomplishments, education opportunity to upgrade knowledge and skill level for the ICT staff, etc. were few to mention. Similarly, ICT knowledge and usage in day to day performance of employees has got admin recognition and thus, they are evaluated for the effective use of technology as part of employee appraisal.
- Commitment from decision makers to overcome the barriers and challenges for change was one of the vital factors that contributed to the success of the e-government implementation in this district. More importantly the management style which focused on participation of stakeholders and on seeking consensus among concerned parties contributed enormously in solving conflicts and problems occurred during the implementation and operation of the project. The top management's effort is supplemented

by the unreserved effort from the ICT staff to support the change effort. Hence, the top management and committed ICT team take the lion's share of the achievement.

- The willingness to accept new things is high among the top management and civil servants. They have good track record on change management and previously the district was selected and prized as best performer in change initiative in different sectors at regional and national level. Through time the community has developed a culture to own change efforts and motivated to perform better. Their secret of success in relation to change initiatives lies basically in their way of implementing change efforts. They follow an organized and planned way of managing change and there is close follow-up and evaluation throughout the implementation process. Their change management mainly depends on a system and not on individuals. The district management believes that change is mainly about attitude of people. So change activities mainly are done on the attitude of the human element. The attitude is function of the awareness and knowledge about an issue. So, if awareness is created and knowledge and skill provided, then as district they believe that the attitude can be changed. The management believes that if attitude can be changed then any change can be brought and same applied when it comes to the introduction of the WoredaNet services. When a change initiative comes, the management makes discussion among the employees at different levels, have action plan, assess strengths and weaknesses in previous change management efforts, extracted best lessons out of those previous efforts, and build on those best practices to adopt the new initiative. This is what was done during the implementation and institutionalization of WoredaNet.

#### 5.3.1.4 *Sekela*

WoredaNet facilities were presented to the district around 2006/07 during phase I of the project roll-out. The project team from MCIT and regional ICT agency left without completing the installation. Local team was not part of the project team and thus technology transfer was not done. Couple of efforts were exerted since then but still the WoredaNet is not made functional and the admin units have not experienced the benefits so far. As a result, informants perceive that WoredaNet is unsuccessful in their district. This is what the researcher has witnessed on the ground. It was not possible to get perception of the informants on how WoredaNet contributed to improve the admin processes in the district.

Summary of the discussion with informants on their perception about possible internal and external factors that have contributed for the unfavorable situation of the WoredaNet are presented as follows:

- The top management believes that the lion's share role in the implementation as well as addressing infrastructure-related challenges is that of the regional and federal government. They think that their role will be facilitating utilization of the technology once it is put in place. Awareness of the top management on the value of ICTs and their willingness to cooperate with the ICT staff have been low.
- There has been weak financial and administrative support from the management. Resistance from the managers and other stakeholders was evident. The management and civil servants did not even recognize professionals and activities of the ICT unit. They have

not experienced the real value of the technology and thus claim that they have no ground to consider it as their own.

- There were efforts to organize short-term trainings by the ICT unit for the management and civil servants. Managers of some sectors did not allow their subordinates to attend the in-house training. Even the ICT unit tried to deliver trainings after office hours and weekends but the willingness from the civil servants was low.
- Majority of the informants pointed that the position of the ICT unit in the organizational structure is one of the areas that need to be revisited. As per the directive by the MCIT at the federal government, the ICT unit was under capacity building office during early periods of the WoredaNet. Through time it was recognized that such positioning of the unit affected its visibility. As a result, the ICT unit is organized under the district administrator's office currently. The unit has no budget of its own and fully dependent on the administrator's office for same. The financial and other resources provided to the unit depend on the awareness and willingness of the head of the administrator's office. Hence, the smooth flow of activities mainly depend on personal communication and willingness of individuals than on formal procedure. This hindered the unit from operating at a required level, influence other sectors, communicate smoothly with other sectors, raise issues at management level, get financial and material resources required, and communicate with stakeholders such as regional ICT offices. The top management also didn't take practical measures to address the prevailing challenges.
- There is also no formal organizational relationship between district WoredaNet centers and regional ICT agency and indeed this is uniform across all other regions. This significantly

affected the relationship between the two levels and in turn affected operation of the WoredaNet centers in general. This had also implication on the technical support, communication of guidelines, rules, and regulations; fulfillment, retention, and development of ICT staff. For instance, the district administration and the ICT unit externalize the cause for the unavailability of WoredaNet. The ICT unit and the district administrator claim that the technical support rendered from the regional ICT agency was not satisfactory and timely. Besides, the ICT unit believe that the effort exerted by the district administration to push the regional government to address challenges was limited.

- In this district, there is limited experience in managing change initiatives. Instability of the political leaders in addition to lack of change management culture in the district contributed for the failure to adopt the technology.
- There is no motivation and incentive for ICT staff in the district. This disappointed the professionals and forced them look for better job and salary elsewhere. Besides, using ICT's to perform their administrative activity is not included as an evaluation item in the appraisal system of employees. Thus, using technology to perform their activities is not administratively recognized and technology use is not considered as requirement but only a personal preference.
- Informants also stated that there has been instability of electricity and telecommunications infrastructure since the WoredaNet facilities were first presented to the district.

### 5.3.2 Cross-case Findings

The with-in case analysis helped figure out the general context of each case and the favorable or unfavorable conditions that contributed to the phenomena in the context of each case. The with-in case analysis showed that implementation of same technology could yield different result depending on different contingency factors. The four cases explain possible differences between the two categories.

Noticeable findings of the multiple case study can be summarized as follows:

- Lack of awareness about ICTs among top management (political leaders) is found to be key problem that lead to couple of other problems.
- Leadership commitment at district level significantly affected the implementation and operation of WoredaNet services through provision of political support and required resources.
- Need-based and hands-on short-term trainings impacted the management and civil servants to be aware and competent to use the technology.
- Access to technology influences the knowledge and attitude towards adoption and use of technology.
- Good change management culture brings difference in the adoption of technology.
- Infrastructure challenges hampered implementation of WoredaNet among districts.

- In those districts where the WoredaNet is not yet functional, the management and civil servants have developed sense of dissatisfaction on the value of the technology and are disregarding its benefits.
- Availability of motivated and capable ICT staff is vital in performing activities of the WoredaNet centers.
- Recognition of use of ICT skills as an item in employee appraisal system motivated civil servants to use the technology and become more interested to know about the technology.
- Recognition of the ICT unit and representation of the unit at management level brought better visibility for the unit and helped the unit get access to resources and involve in organizational decision making.
- Limited knowledge, experience, and skill of ICT professionals at district level and limited technical support from regional ICT agencies negatively influenced operation of WoredaNet centers.
- Creation of an enduring demand for using the WoredaNet services and integration of the services into the decision making process are achieved through continued training and capacity building efforts and also by recognizing IT use as part of employee appraisal system.
- Use and institutionalization of WoredaNet services are also influenced by local characteristics such as prior access to technology and positive attitude created as a result. So, local socio-historic circumstances have also contributed to institutionalize the services.

- ICT staff's effort to practically show things done at the beginning of the project helped to gain top management's buy-in and willingness to cooperate.
- Success stories in previous development and change management initiatives as well as prior experience on positive role of ICT in initiatives such as BPR influenced awareness of the top management and also brought strong support from regional governments.
- Practice to self-sustain and free from external support helped in situations where there is limited external support.

The cross-case analysis in this section help us figure out the similarities and differences of the four cases. Hence, the summary out of the with-in case analysis is reviewed to find out any implied relationships for the variables which ultimately helped us develop the e-government sustainability framework.

As presented in section 5.3.2 above, the results out of the related cases (which are based on the literal replication) reveal that there exist similarities between the cases in same group. This again helps us figure out the variation between the two categories of cases (which are based on theoretical replication). Noticeable sources of variation between the two categories are discussed as follows.

In the case of Lasta and Damot Gale, the top management exerted its commitment to implement and institutionalize the new technology by expressing its willingness to adopt the technology, availing required resources, getting rid of resistance from within the organization, aligning the values of the new technology to the organization, and considering ICT-related issues as one of the priority agendas. The top management used its authority to resolve political conflicts and influence

the behavior of all other civil servants by encouraging system use. Whereas in the case of Sekela and Isara, the political leaders did not explain their commitment to push implementation of the new technology.

The two categories of districts mainly differed in their effort to create common understanding and ownership of a change initiative. In the case of Lasta and Damot Gale districts, the employees are too enthusiastic in adapting to changes. Obstacles to successful change have been inadequate senior management support and employee resistance at all levels. One of the reasons for such resistance has been lack of awareness about the change. Thus, effective communication was used as a tool for the change management exercise. The human element was the central focus of the change management and communication plan in the case of Lasta and Damot Gale districts. In light of the WoredaNet, the two districts conducted awareness creation and skill trainings for the users. In addition, incentives and reward mechanism were used by the management as an effective means of increasing the motivation levels of the employees. This implies that for successful project implementation, change management strategies should particularly aim at supporting those who will be most affected by the change.

In the case of Sekela and Isara, the WoredaNet facilities were not put in place due to internal and external reasons. The facilities were presented to the two districts by their respective regional governments at the same time of the roll-out to other districts in the regions. Common external reasons are: weak coordination between the regional ICT agency and district administration during the project conception; instability of telecom and electricity infrastructure; the technical support from the regional ICT agency was not satisfactory, timely, and problem-solving one. Common

internal reasons are: top management did not consider ICT as one of their priority agendas and no follow up through ongoing monitoring and evaluation. As a result, their commitment to render required management support has been limited. The top management did not take the initiative to push the regional government to address the challenges and avail the technology to their districts. They have not taken the leading role to promote the importance of the technology among the community and that resulted in poor buy-in of the technology at their districts. There is limited effort by the management to develop administrative and coordination capacity to actualize the project and to free the ICT unit from dependence on external assistance. In Sekela district, for instance, there were two ICT staff since the conception of the project but there was no close relationship between the top management and the ICT unit which is mainly due to the limited awareness of the technology among the top management.

As far as training & capacity building is concerned, there is no awareness and skill training for the management and civil servants in the case of Lasta and Isara districts. In line with this, there is no motivation and incentives from the management for IT skills among the staff. The ICT staff are also less motivated and not recognized by the top management. In the case Isara, there is even no ICT staff so far although the administrative structure requires three staff. The top management in this district believes that putting a functional technology in place shall come first before staffing the ICT unit. This again may be attributed to the management's awareness on the value of the technology. In both cases, the community did not experience the benefit of ICT and thus there is no ground for them to develop a sense of ownership.

In summary, the sources of difference that were observed in the side of Lasta and Damot Gale goes to: continuous and need based awareness and skill training & capacity building for the management and civil servants; change management and awareness creation effort built on local best practice; motivation and incentives for ICT staff and ICT skill is given administrative recognition through employee appraisal system; repeated awareness creation effort resulted in sense of ownership of the new technology among the community; strong change management culture whereby a new change is systematically planned and followed up by the top management and other stakeholders. There were also ongoing monitoring and evaluation of the operation of the WoredaNet services, commitment of the political leaders to self-sustain the ICT unit to free it up from external assistance in both administrative, technical and financial terms, and in general the continued effort of top management and ICT staff to institutionalize the project into local setting.

## **5.4 Discussion**

The purpose of the discussion section is to interpret and describe the significance of our findings and to explain insights about the problem by taking the findings into consideration.

WoredaNet is a G2G initiative in Ethiopia with an intention to ultimately come-up with a government network. The government seems ambitious and optimistic about success of this big investment. Results of the semi-structured interviews, however, revealed that the relative success of the WoredaNet is perceived differently among stakeholders in different districts and contextual factors are found to be vital role players of the differences. The good thing indeed is that the

investment on WoredaNet is still under way by the government and there also seems keen interest at district level to use the technology.

Political will of leaders is a requirement for any project to succeed in the public sector and e-government is not an exception. Extant literature indicates that strong political leadership is crucial for the success of e-government initiatives. Our data also strongly highlights the predominant significance of leadership in the implementation of WoredaNet. Continuity of support from the political leadership had a bearing on the implementation and performance of the WoredaNet. Without ongoing and active political leadership, the financial resources, inter-sector coordination, institutional changes and human effort required to plan and implement e-government cannot be attained. The level of involvement of the top officials during the implementation greatly impacts how fast or smooth the implementation of the e-government can be carried out and their sustained support during the post-implementation periods assures its long-term success. Sustained interest of political leaders on the e-Government project is important to keep the impetus of a project moving forward. If the leaders' interest on the project can be kept high, it is more probable that long term success of the project can be attained because interested and motivated leaders can influence their subordinates and avail required resources. It is, thus, crucial to guarantee that the political leaders recognize the value of such e-government initiatives to enable a sustained interest and commitment to support the effort.

The need for awareness and positive perception among leaders on the value of ICT came out strongly in our data. The success of any development effort largely depends on human skills and capabilities. Sufficient number of skilled personnel in the utilization of information technology are

indispensable. A lot has to be done in terms of knowledge and skills of using WoredaNet services. It is important to build knowledge users through initiatives raising awareness of the services available through the WoredaNet and skill to use associated services. In the long run, districts may even need managers with knowledge and skill in acquiring e-government solutions and managing their implementation. Awareness creation and on-the job skill trainings must be considered as one of the priority actions in order for the community to be able to use new ICT facilities and services. Creating awareness of local stakeholders about the e-government initiatives and improving their participation in decision making are important elements of participation. Such effort leads to understanding of the values of the project.

The awareness creation efforts and ownership of the project by the political leaders helped the local stakeholders develop sense of ownership and also motivated them to render ongoing support. It is so significant to make sure that end-users and the political leadership recognize that the technology is ultimately to facilitate and improve their activities. They need to understand the long-term benefits of the technology. This may be attained through awareness creation and socialization efforts. Indeed the awareness about value of the technology should start with a knowledgeable leadership and extend to middle and low-level managers as well as the civil servants at large. This can ultimately ensure sense of ownership and support from the community.

Lack of motivation for ICT skill and ICT professionals may disappoint the professionals and then force them look for a job elsewhere which in turn endangers the day to day operation of the WoredaNet centers. It should be underlined that the success of such initiatives depends largely on human skills and capabilities. Hence, education and training initiatives must be considered as

priority actions. Incentives shall be put in place to prevent the brain drain of professionals. Planned and continuous awareness creation effort through series of workshops, events, seminars, and conferences is required to better create clear impression about the benefits of the WoredaNet among all stakeholders.

E-Government is considered as a transformation process. It requires changing how officials and other actors think and act, and how they view their jobs. In line with this, our data revealed that the level of resistance to change and level of involvement by officials in setting direction greatly impacts how fast or smooth the implementation of e-government can be. So, change initiatives must be addressed in an organized manner because a change commonly brings with it the possibility of unexpected outcomes and difficulties.

Hierarchical administrative structure between related units of government dictates that there exists administrative relationship in terms of support and execution of responsibilities. The funding and technical support was provided by the federal government when WoredaNet project was initially implemented. The case study revealed that provision of technical assistance and resources to run the WoredaNet centers has been comparatively inconsistent among districts. This lack of sufficient and sustained technical support from regional government during the post-implementation period and lack of official financial source to support activities of the WoredaNet centers implied the need to look for local funding sources and capacity building alternatives for ICT personnel at district level. It seems that the government has focused more on implementing the technology among districts throughout the country without sufficient effort on setting formal means of coordination and collaboration among the WoredaNet centers, regional data centers, and MCIT and without building the capacity to manage the WoredaNet centers. This may also create a gap among districts

in their ability to get resources and manage the technology as intended. The infrastructure only is useless unless competent technical personnel are able to manage it effectively and promote the benefits. Although it is not possible to totally avoid assistance from higher bodies, our data also show that it is important to minimize the level of dependence on the higher body for technical assistance especially in situation where there is no formal administrative relationship to the regional ICT agencies. It also requires development of institutional arrangements in order to assure the operation of the WoredaNet and actions need to be taken in order to make sure that knowledge transfer is made from technical personnel at regional ICT agencies to district IT staff. Though local efforts by successful districts are promising, the support from higher body shall still be in place as WoredaNet is a big government network that needs cooperation and teamwork between the three tiers of government.

The findings revealed that in some cases there were coordination problem among the concerned bodies at the three tiers of government during the implementation of WoredaNet. This shows that there was limitation among the WoredaNet centers, regional ICT agencies, and MCIT in executing their duties and formally communicate as well as evaluate their performance. This affected the implementation as well as on-going operation of the WoredaNet. It is important to define a clear mandate and responsibility to ensure proper co-ordination and cooperation among concerned units at the three levels of government. The implementation and on-going operation of the WoredaNet needs to be periodically monitored. Such monitoring and evaluation of a project helps identify the benefits realized and identify challenges holding the WoredaNet back. This may be effected by setting up formal organizational relationship among the three tiers of government.

WoredaNet project was a national project implemented in large number of districts throughout the nation within short period of time. The facilities at a woreda center are uniform (carbon copies of each other) and organizational structure of the center is uniform throughout the nation. No needs assessment is done in each local context prior to project implementation. It seems that MCIT took assumptions to have ideal structure of woreda ICT centers. It is difficult to assume their local reality without local user participation. In reality, there is a great deal of diversity in Ethiopia. The geographical situation is completely different from district to district. Their culture is also diverse as per ethnic groups. The stability of infrastructure differs from urban and rural areas. Thus it is possible to build a state of the art system and yet have problems convincing targeted users to make use of it. In order to avoid such problem or minimize the gaps, local user participation is crucial and particular attention needs to be made to ensure that the local realities and needs of users are taken into consideration while designing an e-government project. Last but not least, unless infrastructure challenges such as telecommunications, electricity, and road can be addressed by the government in due concern, it may significantly affect the existing as well as new e-government initiatives in the future.

## **5.5 Chapter Summary**

The case study chapter detailed the process of research activity in the field, presented the findings and discussed their implications. It is tried to substantiate the variables identified as enablers for the two core concepts of the study. Out of the twenty four variables observed in the field, fourteen variables are found important to explain the phenomenon on the ground and these variables are: leadership commitment, appropriate training and capacity building, participation of target group,

building on local knowledge expertise, motivation and incentives for IT skills, developing sense of ownership, choosing appropriate technology, continuously meeting stakeholders' needs, independence from external assistance, institutionalizing project into local setting, sustaining political leadership, developing institutional administration and coordination capacity, continuously matching available resources, and ongoing monitoring and evaluation. These variables were found to be potential inhibiting or facilitating factors of long term success of e-government initiatives. We believe that these factors could be the vital concerns for consideration if long term success of e-government initiatives have to be achieved. The remaining ten variables did not yield significant data from the cases, but this may be because respondents had no idea about those variables at district level. As a follow-up, next chapter (chapter six) deals with development of a sustainability framework for e-government success.

# **CHAPTER SIX: SUSTAINABILITY FRAMEWORK FOR E-GOVERNMENT SUCCESS**

In the preceding chapter, we have come-up with insights of the findings of the case study. As a follow up, this chapter deals with the proposed sustainability framework for e-government success. This chapter brings together the components of the state-of-the-art diagram (figure 3.1 in chapter three) and the findings of the case study chapter. Guided by structurational model of technology, synthesis of the findings are done together with pictorial representation of the relationships between the findings. This ultimately leads to the development of a sustainability framework for e-government success.

## **6.1 Framework Development**

The framework development in this research is guided by structuration theory and more specifically on structurational model of technology. First, it draws on the state-of-the-art diagram in theory formulation (figure 3.1) as a spring-board and figure out the noticeable findings and insights of the multiple case study in previous chapter in light of the premises or properties of structurational model of technology.

As presented in the literature review in chapter two (section 2.1.3), Giddens' Structuration theory has long been used by information systems researchers (Rose & Scheepers, 2001; De', 2008) as a way of deepening understanding regarding the mutual interaction between social structure and the agency in terms of human interaction in organizations. Specific to studying technology in organizations the theory serves as a useful theoretical lens that can help understand the relationship

between technologies, the people who interpret them, and the patterns of use that stem from that interpretation (Lewis & Suchan, 2003). From an information systems perspective, Orlikowski underlines the importance of taking both technology and human action into account in order to study technology and organizational structural formation in a balanced manner; and her preference was structuration theory (Orlikowski, 1992). Orlikowski & Robey (1991) (in De', 2008) found the following four important interactional influences of IT within organizations: (a) information technology is shaped by humans within the organization; (b) information technology both facilitates and constrains human action. It thus becomes a part of the schemes, facilities and norms that determine the structures in the organization; (c) design standards, codes, and norms embedded in the technology influence human interaction with the technology; and (d) information technology mediated interaction affects the structures existing in any organization.

Hence, structuration theory (specifically its appropriated version for information systems research context named structural model of technology) is used as an analytic tool to explain the relationship between the variables of e-government success and sustainability based on the findings of the case study.

## **6.2 Components of the Conceptual Framework**

This section describes the components of proposed conceptual framework. These components are: the two core concepts, IT-enabled administrative processes, enablers of e-government success, evaluation dimensions of e-government success, enablers of e-government sustainability,

evaluation dimensions of e-government sustainability all extracted from the literature review (in chapter two and three) and relationships among the variables (detailed in section 6.4).

- **E-government success:** is a measure of the degree to which the evaluator of the e-government finds that the stakeholders (related to the e-government initiative in focus and in whose interest the evaluation is being made) are better off. The evaluation through the stakeholder perspectives can be considered as a proxy for the successful performance of an e-government initiative or for the achievement of its objectives.
- **E-government sustainability:** In this research, e-government sustainability is considered as the endurance of the benefits sought out of IT investments in the public sector where those benefits keep continuing into the future for reasonable period of time until the expectation of the stakeholders are addressed.
- **IT-enabled administrative processes:** These are sequences of IT-supported activities triggered by office tasks and/or procedures that are executed to keep an organization perform its administrative objectives. Usually processes are supported by information technology (IT) in order to enable the provision of new or improved services and/or to increase the efficiency of the processes. The interconnected activities including diverse interactions with technology may both shape and be shaped by new forms of organizing the process.
- **Enablers to e-government success/sustainability:** An enabler to e-government success or sustainability is considered as a facilitator/catalyst or active contributor that makes a successful/sustainable implementation of e-government feasible or possible; a facilitator that ensures supply with the means, capacity or opportunity for an e-government

success/sustainability. On the contrary, barriers to e-government success/sustainability are factors that obstructs or impedes or act as an obstacle to a successful/sustainable implementation of e-government; a factor that limits the proper execution of an e-government initiative; a factor that opposes, stands in the way of, denies required supply of, or holds up the smooth progress of e-government implementation.

- **E-government evaluation:** E-government evaluation is about examining, ascertaining, judging and/or appraising the implementation and/or outcome of an e-government project/initiative based on explicit evaluation objectives, criteria and applicable methods. E-government implementation is an act of putting an e-government project/initiative into practical effect; the carrying out, execution, or practice of an e-government plan/design; encompassing activities and processes for getting new e-government projects “up and running”, i.e. to operate properly in their environment, such as funding, staffing, acquisition, installation, configuration, testing, supporting and change management.

### **6.3 Formation and Impact of WoredaNet Project**

Guided by structural model of technology, this section discusses formation of WoredaNet and its impact on institutional properties resulting in organizational formation. The section elaborates that fact that implementation, appropriation, and use of the technology is facilitated or constrained by organizational structural properties and its continued use in turn influenced formation of institutional properties. Figure 6.1 shows structural model of technology operationalized to WoredaNet organizational context.

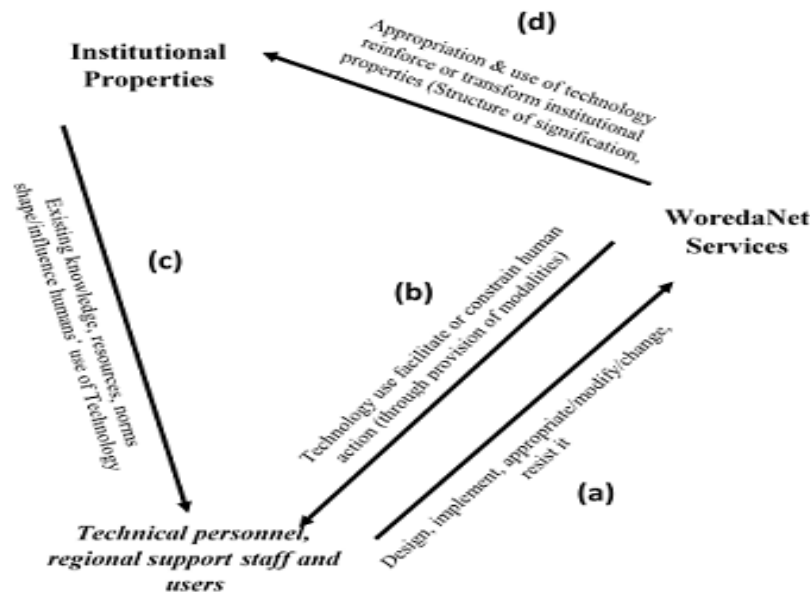


Fig. 6.1: Theoretical Lens Operationalized to context

The elaboration below (sections 6.3.1 – 6.3.3) and the discussion in section 6.4 on the relationship between variables are based on the components presented in section 6.2 and the relationships of the operationalized theoretical lens in Figure 6.1.

### 6.3.1 Institutional Conditions of WoredaNet Implementation

Implementation of WoredaNet project was facilitated or constrained by different institutional conditions and socio-historic context of the respective settings. The project was one of the initiatives by the government of Ethiopia in order to bring efficiency and effectiveness across the public sector in the country. It was implemented in a top-down fashion by the government. The federal government availed the facilities and technical support to regional ICT agencies. Accordingly, technical support was provided by regional ICT agencies and political leadership and

administrative support was rendered by the districts. In those districts where the WoredaNet is functional, the management took the initiative to avail resources to assure its operation and continued use. The limited technical support from regional ICT agency, lack of awareness among the top management, lack of ICT professionals, and poor administrative relationship with stakeholders hindered those districts from successfully implementing the technology.

### **6.3.2 Institutional Conditions of Interaction with WoredaNet**

On the other hand, the use of WoredaNet services was facilitated or constrained by different institutional conditions and socio-historic context of the setting. Use of the technology by the civil servants was enforced or constrained by the structural properties of the existing administrative system. In line with this, although the technology is carbon copy across all districts, there exist differences among districts in terms of institutional and socio-historic factors such as institutional readiness, adaptability culture, change management experience, prior exposure to technology, etc. Awareness about the technology, skill, knowledge (including knowledge on technology's embedded rules and assumptions), resources, and norms shaped and influenced the continued use and appropriation of the technology. A good change management culture and a good culture to self-sustain (free from external assistance) helped to keep the services going in some districts.

### **6.3.3 Institutional Consequences of Interaction with WoredaNet**

Through time, institutional properties were also influenced by continued use of the WoredaNet services. The use of technology in the long run has influenced structural properties of the districts. In this regard, continued use of the technology by some stakeholders resulted in transforming the

existing institutional properties by making the civil servants follow new work procedure and also changed their mindset in accomplishing their duties. The government's aim when investing on this project was to bring efficiency and effectiveness to the administrative processes and ultimately bring transparency and good governance at different levels of government. Apart from the technology implementation, the technology demanded change in institutional setup and attitude of the civil servants. Continual training and capacity building effort helped the technology users appreciate the benefits and made them conform to the embedded assumptions of the government. Besides, the effort to appropriate and customize to the local setting helped the user build trust on the technology's intended purpose and thus motivated to sustain the institutional structure in which the technology is deployed.

In those situations where there is no proper communication and training activities in relation to the technology, users did not use the new technology as intended. This in turn made them undermine the assumptions behind the technology as well as strategic objectives of the government. In those districts where WoredaNet services are not functional, both the management and employees disregarded the use of the technology in their day to day activities undermining its purpose. Whereas those that are using the WoredaNet services have accepted those new ways of doing their task as accepted practices and procedures. Those who didn't get the opportunity to exercise the technology due to different reasons preferred to keep the status quo. Therefore, continued training and capacity building effort as well as continued use of the technology by at least some stakeholders helped to transform the institutional structural properties which in turn created conducive environment for long term success of the project.

## 6.4 Relationships among Variables

Structurational model of technology helps understand how institutional properties and other socio-historic factors constrain or facilitate the design, development, implementation, appropriation, and use of technology in organizations; and how continued use of technology in turn affect institutional properties. It helps us understand interplay between organizational formation and technology formation rather than guiding our understanding about success and sustainability of the benefits resulting out of technology integration into organizations. So, using this model as a theoretical foundation, this study makes enabling factor analysis aimed at interrelating the two concepts through their enablers (which were initially emerged out of the literature).

Drawing on the discussions on the results in chapter five and based on the insights obtained from the empirical work, possible relationships among the enablers of the two concepts are presented in a form of theoretical propositions as follows. Building on enablers and evaluation dimensions of the two concepts (emerged out of review of related literature) and considering the insights obtained from the empirical work on the potential relationships between enablers of the two concepts, a conceptual sustainability framework is ultimately suggested.

**Proposition #1:** *Presence of committed leadership results in developing institutional administrative capacity, institutionalizing project into local setting, freeing from external assistance, availing enduring political leadership, and making ongoing monitoring and evaluation.*

Top management has multi-dimensional role in project success and sustainability. Top management's commitment and support is expressed through efforts such as provision of required resources; continuous support during the project implementation and throughout the operational phase of the system; willingness to discuss problems associated with the project; appreciating the optimal use of the system; and providing incentives for key stakeholders to support operation and utilization of new systems.

In our study, leadership outshined as a vital factor, in the implementation, institutionalization and utilization of WoredaNet. Leaders at district level significantly facilitated the implementation and operation of WoredaNet services through provision of political support, availing required financial and material resources, recognizing ICT services, and making periodic monitoring and evaluation of ICT related activities, tackling unintended resistance from within the organization, provision of incentives for ICT staff in recognition of their performance (new salary scale, for example, at Federal Supreme Court), etc. These mainly imply the degree of top management commitment and support to the new system.

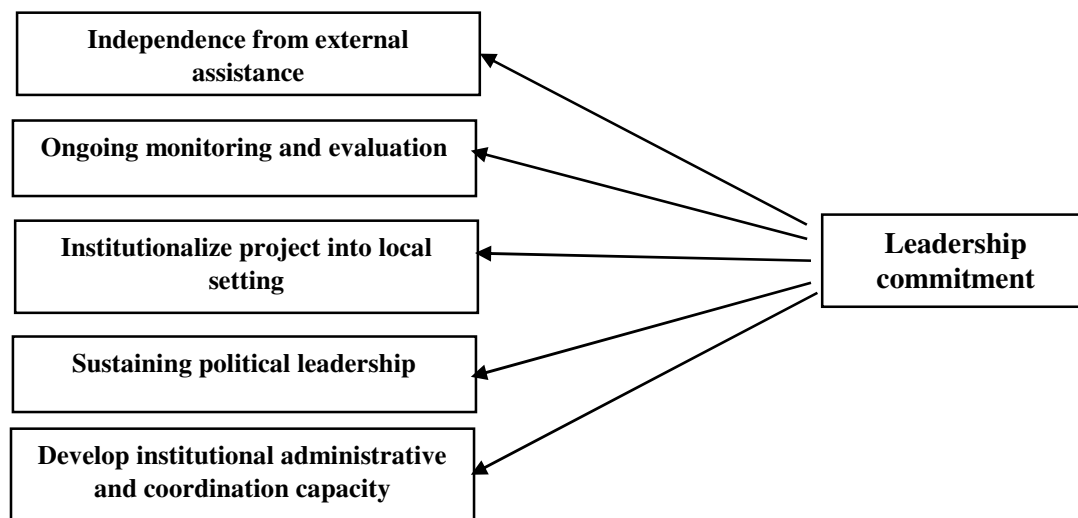


Figure 6.2: Multidimensional role of leadership on e-government projects

Couple of challenges in relation to the WoredaNet are attributed, directly or indirectly, to the organization of the WoredaNet function in the administrative structure of districts. Recognition of the ICT function and its representation at higher level of the decision making ladder has brought better visibility for the IT function (eg. in the case of Lasta District and Federal Supreme Court); and helped the IT function get access to required resources and involve in strategic decisions pertaining to ICT related matters. Providing higher position for IT function can provide the unit with more power in the organization; helps influence the top management perceptions about the value of IT-enabled systems; gain top management's commitment and continuous support whenever required; and in turn can significantly facilitate success and sustainability of IT-related admin processes throughout the organization. This mainly implies the degree of top management commitment to recognize the strategic role of the IT function; and help the top management focus in developing institutional administrative and coordination capacity aimed at empowering the IT function.

**Proposition #2:** *Participation of target group in a project and appropriate training results in developing sense of ownership of project among the target group.*

Encouraging local buy-in among stakeholders and developing sense of willingness to invest effort and resources in the implementation and utilization of a project is important for project success. Participation of local stakeholders during project implementation; and continuous communication with them during project implementation helps in developing sense of project ownership. Stakeholder participation creates a sense of ownership and leads the design and development of problem-oriented solution. To that end, organizations need to have skilled human resources with

the ability to creatively adapt new technologies to the local context and also manage the whole process of implementation. This can be facilitated by availing continuous and need-based training that is sensitive to the stakeholder's ICT skill gaps. Accordingly, key stakeholders need to be encouraged to accept and use e-government solutions. Being at the forefront of managing the implementation and institutionalizing of ICTs in organization, top management needs to be well aware about the strategic role of ICTs in their organization. Similarly, ICT skills of end-users (employees) need to be enhanced in order to assist them build required capabilities to effectively utilize e-government services in their day to day activities.

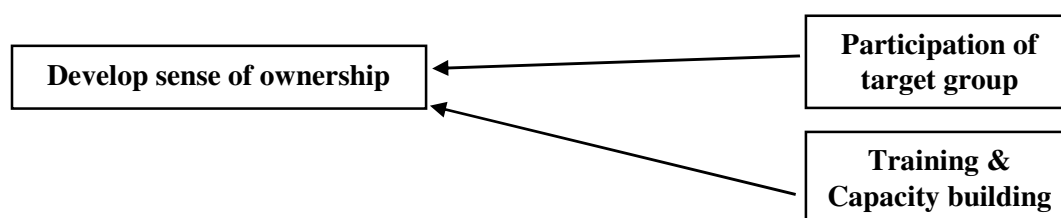


Figure 6.3: Role of user participation and training in developing sense of ownership

Continuous and need-based trainings as well as participation of target group in the course of project implementation and operation are found as key factors behind the effort in creating sense of ownership among the stakeholders across the districts. Certainly, the stakeholder's noble understanding of the apparent usefulness of the WoredaNet services; success stories in previous development and change management initiatives; and prior experience on positive role of ICT in initiatives such as BPR influenced awareness of the top management have resulted in strong support from regional governments for a successful implementation of the WoredaNet. This mainly implies the degree of perceived usefulness of the system by stakeholders; and is primarily

indicative of the fact that developing sense of ownership of a project among top management and local community is vital in sustaining projects.

**Proposition #3:** *Availing incentives for IT skills helps in institutionalizing project into local setting and motivates the IT professionals to exert their effort in filling technical and administrative gaps to attain independence from external assistance.*

Factors related to the human resource such as inadequate number of IT professionals, lack of IT skills, and lack of incentives for IT skills are among reasons that contribute to failure of e-government initiatives. In some cases, organizations are forced to rely on external assistance in order to fill gaps in required resources and this may impact project continuity especially when the external assistance ends for some reason. This in turn urges organizations to look for institutional solutions to get rid of external assistance. Independence from external assistance is implied by presence of long-term political commitment to avoid dependence on assistance from outside; and presence of an institution to lead, coordinate and sustain the project. Recognizing IT skills among the management and providing incentives significantly motivates end-users to own the project and use it to support their day-to-day activities. Such recognition and appreciation by top management further motivates IT staff and employees to offer their time and effort to the e-government initiative.

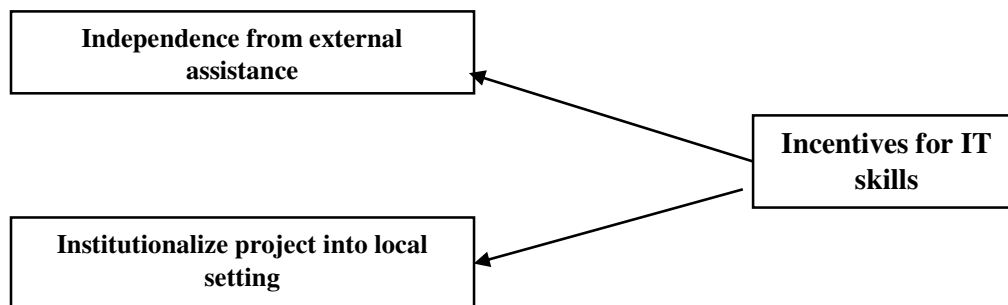


Figure 6.4: Role of motivated staff on self-sustenance and institutionalization

Our study also stresses the importance of motivated and capable ICT staff and end-users in the effort to institutionalize project into local setting; and exerting unreserved effort to build local capacity to reduce or free from external support. ICT staff's effort to practically show things done at the beginning of the project helped to gain top management's buy-in and willingness to cooperate. On the contrary, limited knowledge, experience, and skill of ICT professionals at district level and limited technical support from regional ICT agencies negatively influenced implementation and operation of WoredaNet centers, etc. Therefore, organizations shall strongly capitalize on human resource through several initiatives such as effective and continuous trainings, proper communication, appropriate user support and reward systems, etc. Hence, availability of incentives as motivation for ICT professionals in response to the performance as well as formal recognition of ICT skills as part of the employee appraisal system helped in institutionalize project into local setting and motivated the ICT professionals to exert their effort in filling technical and administrative gaps to attain independence from external assistance. These mainly imply the crucial role of motivated staff on the success of new systems.

**Proposition #4:** *Considering local knowledge expertise during implementation and post-implementation periods contributes in meeting available knowledge resources continuously.*

Communication is integral to any change initiative and e-government is not an exception. Poor communication can be considered as poor change. So, communicating the vision, benefits, and impacts more frequently, actively and across multiple channels to key stakeholders shall be integral to the change effort; and it is also important to monitor the responses. Taking into

consideration the local context associated with sharing knowledge as well as building on change management best experiences positively contribute to assure project continuity.

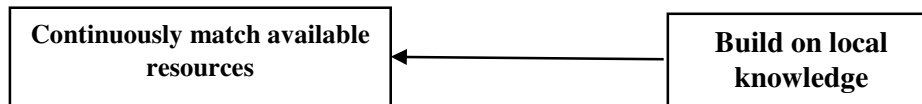


Figure 6.5: Role of local knowledge on project sustainability

In the case of Lasta district, for instance, utilization and institutionalization of WoredaNet services are influenced by local characteristics such as prior access to technology and positive attitude created as a result; institutional knowledge sharing culture; and local change management best practices. So, local socio-historic circumstances such as prior access to the technology positively influenced the knowledge and attitude towards its adoption and use. This mainly concerns the fact that considering local knowledge during implementation and post-implementation periods contribute in meeting available resources continuously.

**Proposition #5:** *If a technology (an e-government solution) is aimed at addressing prevailing (predominant) administrative challenges, it can be continuously useful to at least some stakeholders.*

A technological solution proposed to address a given organizational problem may sometimes fail to meet its intended purpose. One of possible reasons for such failures is the fact that the proposed solution may not consider local realities and needs of the context where it is expected to be used.

Such technological failures in turn may lead to inadequate utilization of the technology because the target users may develop sense of dissatisfaction on the value of the technology and may disregarding its benefits. This is true mostly in those cases where ICT-based solutions are implemented in a top-down fashion following the power and interests of higher level of government.

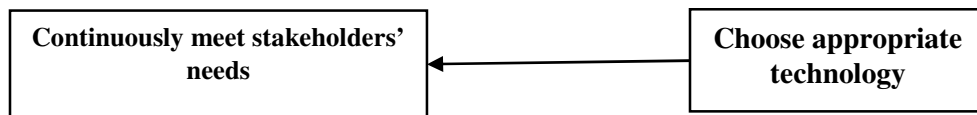


Figure 6.6: Role of technology selection in meeting stakeholders' needs

Whereas in situations where a technology addresses prevailing administrative challenges of the target group, it probably keeps on meeting stakeholders' needs. In the case of Ethiopia, for instance, the difficult landscape, poor road conditions, and bad weather especially during the rainy season have made communication among different tiers of government difficult, inaccessible and inefficient. From citizens' perspective, these situations also made travel from one place to another a very difficult, time-taking, and expensive endeavor. In those cases where WoredaNet is in use, it has been possible to address some of those prevailing administrative challenges the target users were facing. Providing Court services using video conference, for instance, has helped citizens by avoiding travel from districts to zonal and regional centers and the capital, Addis Ababa. Instead of traveling long distance, citizens use the video conference services of the WoredaNet near home town to attend the court sessions conducted at a zonal, regional center or Addis Ababa. The technology has been credited for increasing accessibility and accountability of government; and avoid inconveniences and unnecessary expenses for the citizen. Lack of inputs from target group may result in poor understanding of their needs which in turn may result in poor design of the new

system. These mainly implies that a technology (an e-government solution) is aimed at addressing prevailing (predominant) administrative challenges, it can be continuously useful to at least some stakeholders.

Drawing on the state-of-the-art resulted out of the literature in chapter three and the incorporated the potential relationships elaborated above (from figures 6.2 to 6.6), figure 6.7 illustrates the resulting conceptual sustainability framework for e-government success.

In general, our case study demonstrated that there exists mutual interplay between formation of the WoredaNet and changes in the institutional properties as a result of the technology. The proposed conceptual framework shows that the existence or absence of influencing enabler(s) facilitate or hinder corresponding enabler(s) on the other side and in turn imply potential (un)sustainability of e-government projects. Hence, the proposed relationships in the resulting conceptual framework (Fig. 6.7) denote that the existence or absence of enabler(s) of e-Government success can assist or deter matching enabler(s) of sustainability. For instance, participation of the stakeholders is required at all phases of project and appropriate as well as need-based training & capacity building efforts are required in order to build different skills required to use the WoredaNet services. This in turn helps the stakeholders understand the benefits of the project. Such understanding again leads to acceptance and commitment among stakeholders to own the project and support towards its implementation and continued use. Similarly, committed leaders more probably take leading role in building institutional administrative and coordination capacity in order to organize and lead such change initiative.

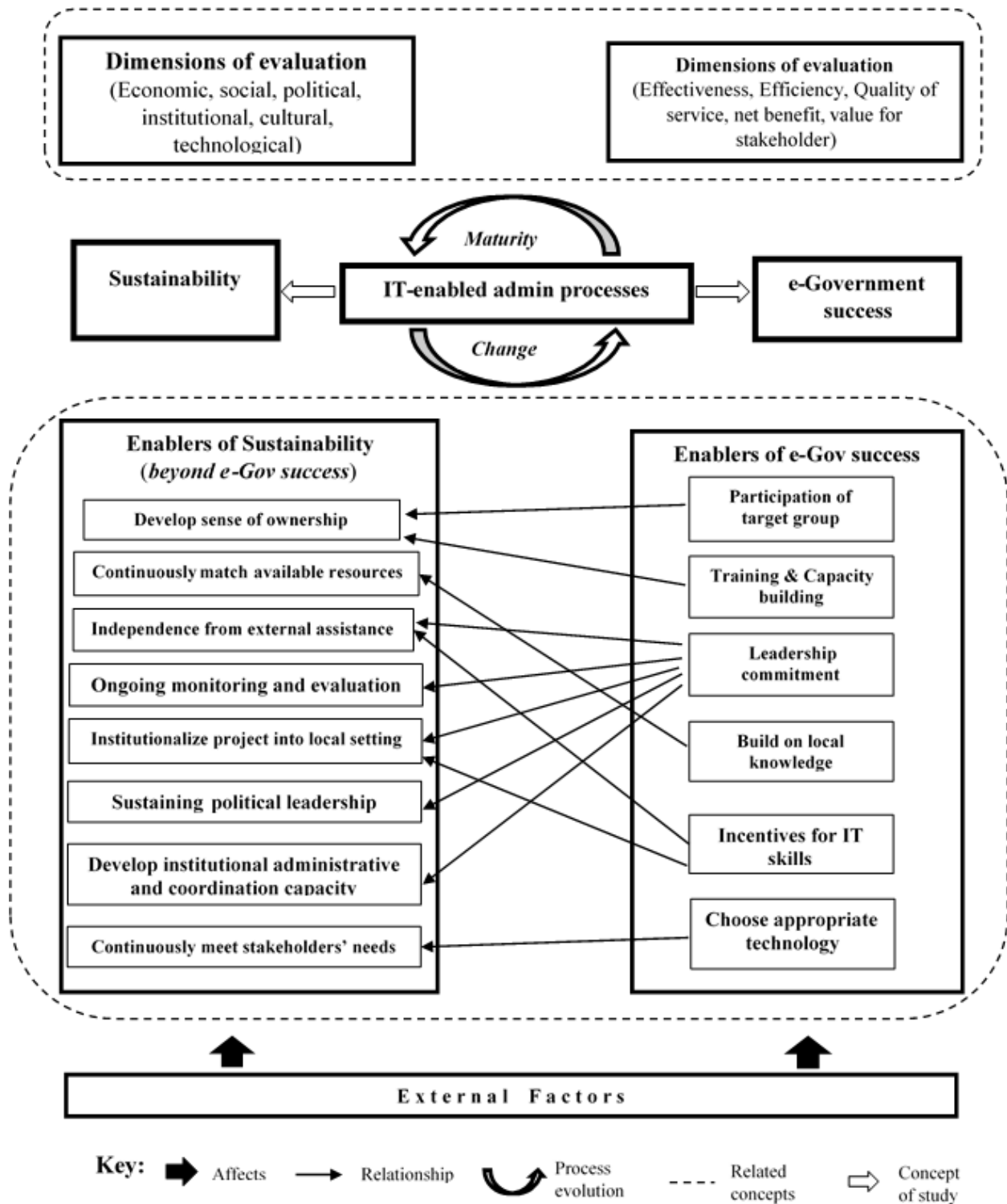


Fig. 6:7 Sustainability Framework for e-Government Success

## **6.5 Feasibility Assessment of the Proposed Conceptual Framework**

In this section, feasibility of the conceptual sustainability framework for e-government that was resulted out of the exploratory multiple case study is assessed. It is aimed at checking the explanatory power of the propositions in section 6.4 in another related setting to the research environment. To that end, a G2C electronic case management system named Court Case Management System (CCMS) is selected at the Federal Supreme Court of Ethiopia. The CCMS has been in operation over a decade and is credited for significantly improving efficiency and effectiveness, bringing transparency and significantly reducing corruption in the federal courts and improved citizen trust on the services of the federal courts. This feasibility check was carried out in three steps. First, qualitative data was collected from stakeholders of the Court Case Management System (CCMS) as per the data collection and analysis strategies described in chapter four. Second, we have presented our findings as per the factors contributed to the success and sustainability of the CCMS. Finally, we have discussed implications of those findings and ultimately presented the revised conceptual framework together with our observation on lessons learned in the new setting in relation to the relationship of the variables emerged out of the multiple case study previously conducted.

### **6.5.1 The Case**

Ethiopia's transformation agenda has evolved over time passing important milestones. Among such transformations is the government's reorganization undertaken in 2001 during which a National Capacity Building Program (NCBP) was launched to upgrade the Civil Service Reform Program (CSR) of the country. The government's NCBP, aimed at rapid state transformation, had fourteen inter-dependent sub-programs. Following the 2001 reform, a Public Sector Capacity

Building Support Program (PSCAP) was launched with the objective of improving the scale, efficiency, and responsiveness of public service delivery at the federal, regional, and local level; empowering citizens to participate more effectively in shaping their development; and promoting good governance and accountability. Six out of those fourteen interdependent sub-programs formed the PSCAP and justice system reform was one of those six sub-programs under which court reform is incorporated (Chanie, 2001). Federal Courts are judicial organs that were established according to the constitution of the Federal Democratic Republic of Ethiopia (FDRE) through proclamation No.25/96. As governmental power is divided into federal and regional administrative structures, jurisdiction of courts is also divided into federal and regional structures. In line with this, three tiered courts were established based on proclamation No.25/96: Federal First Instance Court, Federal High Court; and Federal Supreme Court. Federal Supreme Court is the highest and final judicial organ about federal matters.

In order to effectively accomplish their mission and exercise the power vested on them by the constitution, federal courts have been taking significant measures to make their services more accessible, efficient and effective, accordingly many reform programs have been implemented. Information technology integration is one of the programs launched since 2000 with the intention of making the court services more transparent, accessible, efficient, timely and cost effective. In line with this, Court Case Management System (CCMS) is one of the technologies that are currently being used in the Federal courts. CCMS is an application which automates majority of the registrar's record management process. The application manages every judiciary activity in all federal courts and feed this information to the main data center of the court. It helps to immediately upload new cases filed each day, new decisions, judgments and adjournments passed from the

courts. Any updates on day to day court cases, decisions/verdicts, adjournment day and any related changes regarding the court is updated through this new application. The application has a capacity to manage any changes of a case file from its start until its verdict. It has a capacity to generate over one hundred and thirty different reports for management consumption. Since its implementation of its initial version in 2002 through donor financial support, upgrades have been made twice in 2007 and 2014 aimed at improving its performance of existing modules and incorporating new modules as per the changing requirements of the stakeholders.

### **6.5.2 Data Collection and Analysis**

To learn the implementation of electronic court case management system in the Supreme Court of Ethiopia, qualitative data was collected through interviews, observation and document reviews. Documents were reviewed and workflow was observed to gain an insight of how records are managed from start to finish in the registrar system of the Supreme Court. It also involved personal observations as how services were given to the citizen using the CCMS and how citizens were using the system through its different provisions. Stakeholders of the CCMS are identified based on their relationship to the CCMS. Accordingly, the primary data were collected from the process owners, top management, and IT support staffs. Five study subjects were contacted and interviews were held with: the Deputy Registrar, Director of Information & Communication Services, team leader of software development unit, Database Administrator, and the Court Manager. Four of the interviews were tape-recorded on subject's consent except that of the court manager who refused to be recorded. In addition, different secondary documents related to the CCMS were collected from the public relations office of the Federal Supreme Court. The questions for the semi-structured interviews were adopted directly from the interview protocol used to collect primary

data at the four districts previously, and a copy of the interview protocol were given to each study subject at least a day in advance. Both the interviews were held between April 20, 2015 and May 15, 2015. Follow-up clarifications were obtained through telephone conversations with two of the interviewees in the Information & Communication directorate.

### **6.5.3 Results**

The respondents believe that previously the public was fearful and angry especially in the criminal justice system and the courts were identified as places where citizens are victimized due to lack of transparency and cumbersome process. This prevalent sense of dissatisfaction might have caused a fundamental rethinking of the justice system in Ethiopia. As a result, justice reform may be identified so essential. Hence, justice system reform has been undergoing all over the country since 2001 with an intention to alleviate multitude of challenges citizens have been facing in relation to the court services. In line with this, CCMS was put in place to replace the manual system of all federal courts operation. Before CCMS put into operation, all business processes from case registration to case disposal were accomplished manually. With the increased number of cases being registered, the delay in case management became more critical. A single case takes years to be settled, resulting in hardship for the parties involved. The major reason for this delay has been the unavailability of timely and complete information as and when required. With the introduction of CCMS, the federal Supreme Court aimed to reduce the time taken to settle a case and to manage each case and related information more efficiently.

The frequently stated factors contributed for the success and sustainability of the CCMS at Federal Supreme court based on stakeholders' perspective have been:

- There was internal political desire among key government officials for reform and integrating IT with broader justice sector reform objectives which in turn helped for attainment of CCMS goals.
- The top management were key change agents who had politically dominant situation which was favorable to the CCMS project initiative to take the project forward. They were focused in developing ICT capabilities focusing on building a suitable ICT infrastructure to sustain long-term investments in ICT-enabled reform initiatives, fostering the development of human capital within the Federal Supreme Court to use ICTs for promoting service to citizens, and enabling the skills of employees to effectively use new technology.
- Political leadership with a project champion, use of incentives to create commitment to and ownership of CCMS project, and stakeholder involvement to build support and minimize resistance.
- Federal Supreme Court had good track record of change management and the management has been handling change initiatives in an organized manner. The top management gives due attention for creating awareness among the stakeholders and take time to let the management own the change effort through series of discussions. Then, it plans as how to go for the implementation and make ready other requirements such as budget, human resource, space, time, and other resources. The management plays a leading role in the implementation process of any change initiative and provides immediate response to challenges in the course of the implementation. Besides, there was effective project management which includes defining clear responsibilities among participants of the CCMS project, having good planning and consideration of risk, good monitoring and control system putting in place, good organization of resources, and well-managed

partnership with all key project stakeholders such as donors, and private software development companies responsible to develop/maintain the application at different times.

- They are using well established system development practice to carry out activities of developing, implementing and maintaining automation of business processes. Their system development efforts moved step-by-step learning from past experiences.
- Concerned employees were encouraged to play a part in the design, development, maintenance and management of CCMS;
- Top management has been positive towards issues being raised in relation to ICT. They are willing to cooperate with ICT directorate in matters pertaining to ICT integration. The political leaders took a leading role in promoting the technology throughout the court system. They were willing to listen matters arising from the ICT unit and consider ICT-related issues as one of the key agendas that need due attention. They have served as change agents and actively involved in the project since its conception, and same continued afterwards during all the upgrading efforts afterwards.
- Short-term awareness and skill trainings (locally by the ICT directorate and also outsourced to external parties engaged in providing such services) were organized and offered by ICT directorate at different times for the management and mainly for those whose roles are directly related or associated to the registrar system of the court. Most of the trainings were organized based on prior need assessment and training manuals are provided to trainees during the hands-on training session. Awareness in e-government refers to aggressively marketing the benefits of e-government services. Hence, raising awareness of such applications especially during the beginning (initial stage) of the implementation was considered as one of the methods to avoid resistance from within the organization. Besides,

there were intensive management training program for employees including customer service practices, leadership, communication skills, and creating outstanding and quality customer service.

- The top management of the Supreme Court have positive working relationship with ICT staff and motivate them through different means. Different and continuous capacity building and awareness trainings have been offered to ICT staff as well as to other stakeholders whose duty requires use of the new system.
- ICT staff are always on board to share their knowledge and support CCMS users whenever they face any problem on application use; and their unreserved performance has influenced the top management and other stakeholders to cooperate with them.
- The top management recognizes ICT as one of key enablers to transform court services. As a result, the ICT sector is organized at directorate level being represented in the management committee. The director of the ICT directorate is member of the management committee. The management committee is a higher body that discusses and proposes solutions on different vital matters such as budget and other resources. So, this representation allowed the ICT director to raise key issues pertaining to the directorate and get issues discussed and decided. Same way issues from the top management to low level units is directly accessed by the ICT director. Top management periodically evaluates performance of the ICT directorate with an intention to identify and understand shortcomings and make interventions to improve same.
- Although the CCMS was initially launched through donor funding, the government has been allocating vast amount of budget to support the ICT integration to transform the court system.

- Through time, a culture is created where by lessons learned from one application development project is shared with a new project through joint technical/management problem-solving project teams.
- Support and commitment from senior management was important and required throughout the implementation in order to provide and allocate sufficient resources. Support also motivated the team to work harder in creating new ideas to speed up the processes and to face obstacles such as resistance to change. Resistance to change by some employees within the Supreme Court was a concern. In some cases employees didn't understand the benefits of the new system; whereas others fear from the new technology and its impact on their lives. In line with this, continuous training and awareness creation efforts were considered as a critical element for successful implementation and continued use of CCMS initiative. Thus, it was incorporated within the implementation of CCMS. Training was associated with encouraging employees to accept and use CCMS by helping them to use the CCMS application. This will lead to the increase diffusion of e-government services into societies from the government side and also will affect the adoption rate of e-government from the citizens' side.
- The management provided incentives for ICT staff and systems users to support the new CCMS system. Accordingly, employees were more willing to give their time and effort to the CCMS initiative because the top management recognized and appreciated their contribution. Therefore, the reward system motivated participation at high-level of works. For instance, during the initial stage of CCMS project, ICT staff turnover was high. Considering the role of experienced ICT staff on the success of such application, the top management (in collaboration with the management of ICT directorate) proposed separate

salary scale for IT staff and ultimately got approved by council of ministers. Among other incentives, this significantly helped in attracting and retaining experienced ICT staff.

#### **6.5.4 Discussion**

The results from the CCMS case disclose that political leaders are in the front position of leading and managing the process of institutionalizing such applications into local setting. They were positive towards issues being raised in relation to ICT. They are willing to cooperate with ICT directorate in matters pertaining to ICT integration. The political leaders took a leading role in promoting the technology throughout the court system and are willing to listen matters arising from the ICT unit and consider ICT-related issues as one of the key agendas that need due attention. They have also served as change agents and actively involved in the project since its conception, and same continued afterwards during all the upgrading efforts afterwards. Such support and commitment from senior management is important and is required throughout the implementation in order to provide and allocate sufficient resources. This in turn motivated all key stakeholders work harder in developing an effective and efficient application. The management also provided different incentives for key stakeholders such as ICT staff and end users of the new application to support the successful implementation of the new system. This is because employees will be more willing to give their time and effort to the initiative if top management recognize and appreciate their contribution. Hence, different reward strategies motivate can raise stakeholders' morale and participation at high-level of works.

Understanding the golden needs of the key stakeholders is vital for effective utilization of new systems. This implies that when building applications, great effort is needed to understand the

needs of the end users and to implement applications that work within their level of expertise. Such applications need to be easy to use and foresee the computer skills and self-service capabilities. If the design of such applications fails to incorporate the values of the key stakeholders, then the application is designed to perform something actually different from what its users would like to do.

Adopting a well-established system development practice gives IT managers in the ICT directorate a greater confidence to make decisions on how to go with strategic design decisions at different stages of developing the new application. Besides, evaluation is conducted at different stages of the application development by key stakeholders. Such practice helped in building a shared understanding among the stakeholders and significantly improved the design and development of new applications; and also helped the system development team to make careful selections based on input from target group. Especially adoption of the bottom up approach for CCMS has led to development of a user-oriented application. This is because such system development practice make it possible to incorporate changes over time at different stages of the application development.

Awareness in e-government refers to aggressively marketing the benefits of e-government services to users in the rural and urban areas. Raising awareness of e-government is the beginning of the e-government implementation which is one of the method to avoid resistance to the change initiative underway. In line with this, the ability of users to use and cope with new technology such as access the Internet and the skills needed by citizens to use technologies must be increased. Hence, training is found as a vital element for successful adoption of new e-government initiatives. As the result

discloses, the need-based training encourages stakeholders accept and use new applications. Resistance to accept the CCMS, for instance, was a concern by some stakeholders in the case of CCMS. But the training and awareness creation efforts and more importantly strong political leadership and support of the reform initiative by the top management influences those resisting stakeholders by helping them understand the benefits of the new application and ultimately get convinced to use it.

Drawing on the discussion above, we propose a revised conceptual framework (see Figure 6.8) to sustain e-government projects. Building on an initial sustainability framework in figure 6.7, figure 6.8 introduces a new enabler (namely ‘Promoting Bottom-up Application Development’) and a potential relationship implied out of the new enabler in such a way that it contributed to meet stakeholders’ need in a continuous basis.

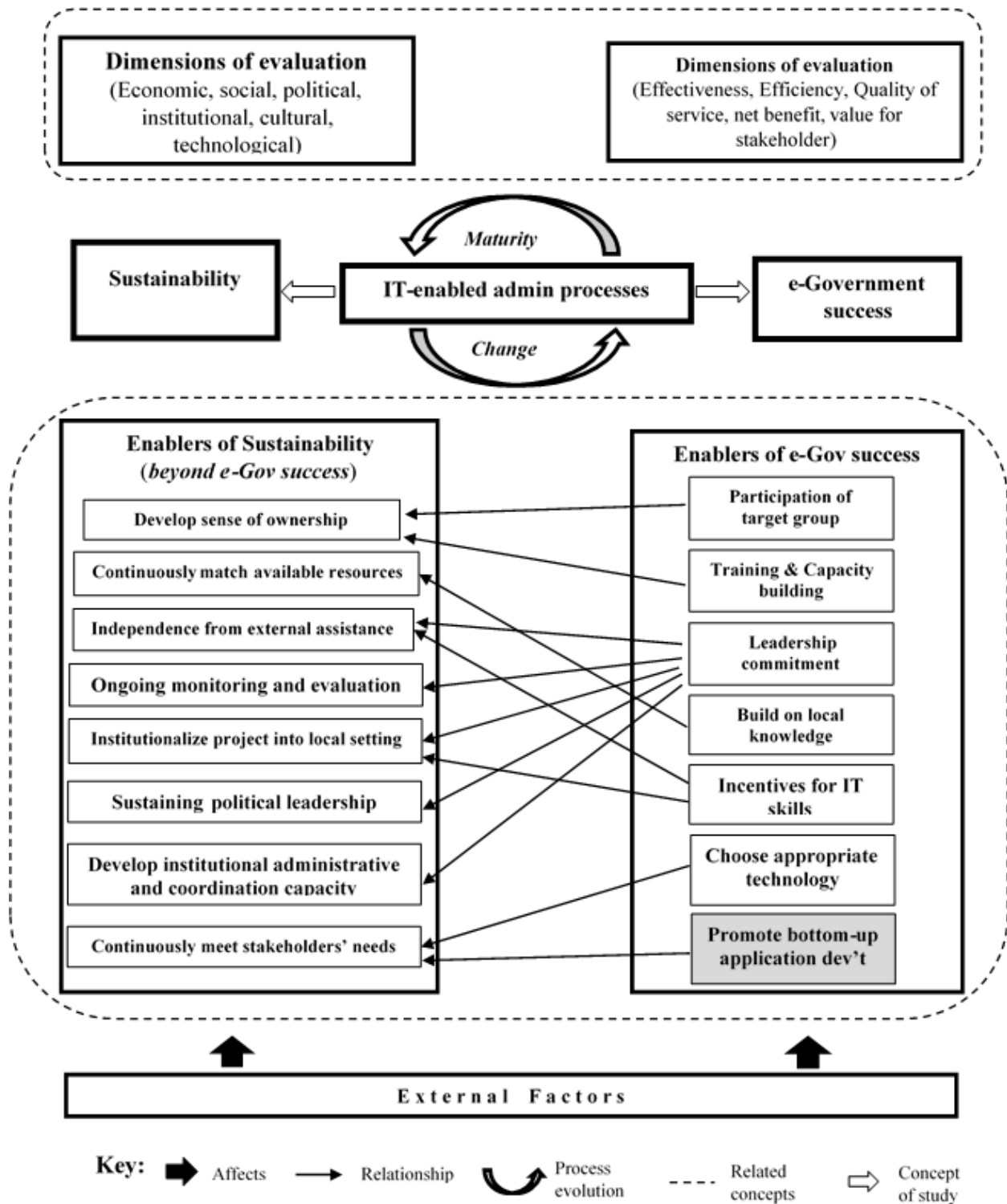


Fig. 6:8 Sustainability Framework for e-Government Success

The discussions in this section confirms the availability of a couple of possible relationships among the variables of e-government success and sustainability in figure 6.7. Accordingly, availability of committed leaders contributed significantly to the success and sustainability of the CCMS through its contribution in developing institutional administrative and coordination capacity, in its effort of institutionalizing project into local setting, through its support to free from external assistance, availing enduring political leadership, and through the effort to make ongoing monitoring and evaluation happen. Continuous and need-based awareness creation and skills trainings as well as participation of target group in the course of the project implementation and operation helped in developing sense of ownership of the project among local community. Availability of incentives as motivation for ICT professionals in response to the performance and formal recognition of ICT skills helped in institutionalizing CCMS into local setting and motivated the ICT professionals to exert their effort in filling technical and administrative gaps to attain independence from external assistance. Considering local knowledge expertise during implementation and post-implementation periods also contributed in meeting available resources continuously and the CCMS continuously meet stakeholders' needs because the application has been appropriate to address some of the prevailing challenges the target users were facing. Besides, the findings in the case of CCMS revealed that understanding the golden needs of stakeholders through bottom-up system development approach positively contributed for continuously meeting stakeholders' needs. Possible reasons for the emergence of the new relationship may be because unlike WoredaNet, CCMS was developed bottom-up considering the golden questions of key stakeholders through their active participation during its design, development, implementation, and maintenance.

From the discussion above, we observe that the findings in the new setting further confirms existence of mutual interplay between formation of the CCMS and changes in the institutional properties as a result of the technology. The revised conceptual framework once again shows us that the existence or absence of an influencing enabler can facilitate or hinder a corresponding enabler on the other side of the equation.

## **6.6 Scope and Usability of the Conceptual Framework**

The resulting conceptual framework can be used as a spring-board for future theoretical deliberation by other researchers engaged in e-government research. Researchers in the area may further explore the elements of the relationship in depth and its effects in different context, and/or attempt to cover more variables, more potential relationships, and even more high level concepts in addition to the ones already forwarded in the framework.

The proposed framework can also be used by practitioners as a quality assurance tool at the beginning, middle, or end of an e-government project. It can be used in any context where e-government initiatives are in place but more preferably on e-government projects in developing countries. Practitioners can use the proposed framework as a tool to assess the quality of e-government projects at pre-implementation, implementation, and post-implementation phases. Besides, they can use the framework as a spring-board to evaluate success and long-term survivability of the resulting benefits of those e-government initiatives.

## 6.7 Chapter Summary

This chapter was aimed at developing a sustainability framework for e-government success. The framework is a comprehensive one in that it will help understand both success and sustainability of e-government initiatives considering set of enabling and evaluation dimensions. Besides, the framework gives insight as to how e-government success and sustainability are related to each other. Besides, feasibility of the initial conceptual framework is assessed in related new setting and the assessment confirms the availability of a couple of possible relationships among the variables of e-government success and sustainability. The feasibility assessment once again showed that the existence or absence of an influencing enabler can facilitate or hinder a corresponding enabler on the other side and in turn imply potential (un)sustainability of e-government projects. In the final next chapter (chapter seven), the research is concluded. By giving brief overview on the chapters so far, the last chapter presents the theoretical and practical contributions of the research followed by limitations of the research and ends up by forwarding opportunities for future research.

# CHAPTER SEVEN: CONCLUSIONS AND FUTURE WORKS

The aim of this research has been to develop a comprehensive sustainability framework for e-government success. The conceptual framework developed in the previous chapter demonstrates the interconnectedness of enablers of e-government success and sustainability and thus aimed at facilitating analysis and understanding of e-government success and sustainability. This last chapter briefly presents overview of our key findings and then presents the theoretical and practical contributions of the study. Finally, it summarizes limitations of the research and proposes research agenda as opportunity for future research.

## 7.1 Overview of the Findings

The objective of this research was to develop a sustainability framework for e-Government success. And in line with this objective, two research questions were posed at the beginning in section 1.2. Although the last two chapters (chapter five and six) provided deeper and richer insights into them, these research questions are revisited once again in light of the key results of the case study.

*How are e-government success and sustainability interrelated?*

Extant literature indicate that there are many factors that affect long term success of e-government especially in developing countries. Building on those factors, this study reveals some important

relationships that need to be considered for successful implementation of e-government initiatives and to keep their benefits for long time. Our study tried to explore how the relationship between these concepts is formed and what it consists of. Factors that are found important in inhibiting or facilitating success and sustainability of e-government initiatives and also implied in the relationship of the two concepts are: leadership commitment, participation of target group, appropriate training and capacity building, building on local knowledge expertise, motivation and incentives for IT skills, choosing appropriate technology, developing sense of ownership, continuously meeting stakeholders' needs, independence from external assistance, ongoing monitoring and evaluation, institutionalizing project into local setting, sustaining political leadership, developing institutional administration and coordination capacity, and continuously matching available resources.

Based on the results of the case study analysis of G2G cases in four districts and a G2C case at Federal Supreme Court of Ethiopia, we proposed a conceptual sustainability framework for e-government. Results reveal the following foremost findings.

To begin with, leadership outshined as a vital factor, directly or indirectly, to the implementation, institutionalization and utilization of WoredaNet. Leaders at district level significantly facilitated the implementation and operation of WoredaNet services through provision of political support, availing required financial and material resources, recognizing ICT services, and making periodic monitoring and evaluation of ICT related activities, tackling unintended resistance from within the organization, provision of incentives for ICT staff in recognition of their performance (new salary

scale, for example, at Federal Supreme Court), etc. These mainly imply the degree of top management commitment and support to the new system.

A couple of challenges in relation to the WoredaNet are attributed, directly or indirectly, to the organization of the WoredaNet function in the administrative structure of districts. Recognition of the ICT function and its representation at higher level of the decision making ladder has brought better visibility for the IT function (eg. in the case of Lasta District and Federal Supreme Court); and it helped the IT function get access to required resources and involve in strategic decisions pertaining to ICT related matters. Providing a higher position for IT function can provide the unit with more power in the organization helped to influence the top management's perception about the value of IT-enabled systems and contributed in getting its commitment and continuous support whenever required; and in turn significantly facilitated success and sustainability of IT-related admin processes throughout the organization. This mainly implies the degree of top management commitment to recognize the strategic role of the WoredaNet function; and helps the top management focus in developing institutional administrative and coordination capacity aimed at empowering the IT function.

Continuous and need-based trainings as well as participation of target group in the course of project implementation and operation are found as key factors behind the effort in creating a sense of ownership among the stakeholders across the districts. Certainly, the stakeholder's understanding of the apparent usefulness of the WoredaNet service, success stories in previous development and change management initiatives, and prior experience on positive role of ICT in initiatives such as BPR influenced awareness of the top management have resulted in strong support from regional

governments for a successful implementation of the WoredaNet. This mainly implies the degree of perceived usefulness of the system by stakeholders; and is primarily indicative of the fact that developing sense of ownership of a project among top management and local community is vital in sustaining projects.

Our study also stresses the importance of motivated and capable ICT staff and end-users in the effort to institutionalize project into local setting; and exerting effort to build local capacity to reduce or free from external support. ICT staff's effort to practically show things done at the beginning of the project helped to gain top management's buy-in and willingness to cooperate. On the contrary, limited knowledge, experience, and skill of ICT professionals at district level and limited technical support from regional ICT agencies negatively influenced implementation and operation of WoredaNet centers. Therefore, organizations shall strongly capitalize on human resource through several initiatives such as effective and continuous trainings, proper communication, appropriate user support and reward systems, etc. Hence, availability of incentives as motivation for ICT professionals in response to the performance as well as formal recognition of ICT skills as part of the employee appraisal system helped in institutionalize project into local setting and motivated the ICT professionals to exert their effort in filling technical and administrative gaps to attain independence from external assistance. These mainly imply the crucial role of motivated staff on the success of new systems.

Utilization and institutionalization of WoredaNet services are also influenced by local characteristics such as prior access to technology and positive attitude created as a result; institutional knowledge sharing culture; and local change management best practices. Prior access

to the technology positively influenced the knowledge and attitude towards its adoption and use. This mainly concerns the fact that considering local knowledge expertise during implementation and post-implementation periods contribute in meeting available resources continuously. Besides, in those cases where the technology is in use, it continuously meet stakeholders' needs because IT has been appropriate to address some of the prevailing administrative challenges the target users were facing.

All in all, the study demonstrated that there exists mutual interplay between formation of the WoredaNet and changes in the institutional properties as a result of the technology and other socio-historic conditions. The proposed relationships in the resulting conceptual framework imply that the existence or absence of enabler(s) of e-Government success can facilitate or hinder corresponding enabler(s) of e-Government sustainability. This is because the enablers of e-Government success are mainly practiced or executed since project conception and can create conducive environment to let enablers of e-Government sustainability in place if properly implemented. This in turn implies that e-Government projects can be successful and sustainable if appropriate measures are taken to maintain the enabling institutional and socio-historic conditions.

*How can successful e-government initiatives be sustained?*

Success and sustainability are ideal outcomes for a project. There are possibilities for a project to be successful although not sustainable. There are also possibilities for a project to sustain although not successfully implemented in such cases where there exists a stakeholder that needs the project to keep going even if it doesn't satisfy the needs of the target group. Our second research question

was targeting as to how to attain the ideal scenario where both success and sustainability can be attained.

Hence, in order to attain both success and sustainability, stakeholders shall maintain the relationships among the variables of the two concepts. Because existence or absence of enabler(s) imply the existence or absence of enabler(s) related to it from the other side of the equation. Hence, to benefit from the IT-enabled administrative processes, due attention shall be given by concerned stakeholders on those enablers in the proposed conceptual framework. If relationships between the enablers of the two concepts can be sustained by assuring existence of the respective enablers, it is more probable that e-government success and sustainability can be attained. The enablers may be essential during pre-implementation, implementation and/or post-implementation periods as required. The role of the stakeholders becomes checking their availability and taking appropriate actions to fill gaps, if any.

Although many challenges exist in relation to e-government implementation in developing countries, there are noticeable successful e-government initiatives in different parts of the world and they can be considered as evidence for the possibility of success by withstanding the prominent challenges. The study shows that with due regard for aforementioned factors, e-Government initiatives can remain successful and keep on yielding benefit. Hence, if the existence of relationships between the enablers of the two concepts can be assured, it is more probable that both e-Government success and sustainability can be attained. More importantly, participation of the stakeholders is required at all phases of a project – during selection, design, implementation, and use. Appropriate and need-based training and capacity building efforts are also required in order to build different skills required to use the WoredaNet services. As e-Government projects

necessitate organizational change, having project champions is a must during and post-project phases. Project champions have the caliber to lead such change initiative and are committed to build the institutional administrative and coordination capacity.

Answering the two research questions presented above, the study contributes to the theoretical domains of information systems in general and e-government in particular. It has also practical implications for policy makers, government officials, and project managers engaged in the introduction and/or management of e-government initiatives. The next two sections focus on the contributions made by this study.

## **7.2 Contributions to Theory**

Our literature review revealed that most of the measures to date focus on evaluating the immediate success of the e-government initiatives while sustainability is an often ignored indicator of e-government success even though project stakeholders usually expect the success to last after the project is deployed (Dzhusupova et al, 2011; Kumar & Best, 2006; Ogunleye & Van Belle, 2014). Prior research mostly focused on e-government success whereas extant literature reveals that the two concepts (e-government success and sustainability) are related to each other and there is growing need to consider them in an integrated manner (Ikerd, 1997; Laszlo et al., 2010). What is still not explored is as how the relationship between these concepts is formed and what it consists of. Our research investigated this topic and attempted to answer the call to direct e-government implementation research beyond success.

Although e-government success and sustainability are both relevant concepts to assess IT-enabled administrative processes in practice, e-government research has not yet elaborated the two concepts in an integrated fashion. Thus, this study first explained the most used sub-concepts and constructs in terms of enablers and evaluation criteria for both e-government success and sustainability. Then, it tried to summarize state-of-the-art in the topic of interest; and ultimately proposed a conceptual framework which explains the relations between the enablers of the two phenomena in focus. The relationship between the two concepts is proposed to happen through IT-enabled admin processes as the concepts are related to this organizational reality (i.e., IT-enabled admin processes). Hence, this is also a new insight provided to the knowledge domain.

Accordingly, our research contributes to the domain of information systems in general and e-government in particular by adding a new comprehensive success and sustainability framework to the literature by uncovering determinant factors of sustaining those e-government initiatives. In doing so, it reduces the uncertainty that exists as to why most e-government projects are unsustainable; and in turn helps understand the e-government context in a better way. The conceptual framework resulted out of this research can be used as a spring-board for theoretical deliberation by other researchers engaged in e-government research. Researchers in the area may further explore the elements of the relationship in depth and its effects in different context, and/or attempt to cover more variables, more potential relationships, and even more high level concepts in addition to the ones already forwarded in the resulted framework of the research.

### 7.3 Contributions to Practice

We believe that contributions made as new knowledge in a subject area shall ultimately impact practice in one way or the other. Accordingly, apart from the theoretical contributions discussed in section 7.2 above, our study also has practical implications for policy makers and practitioners.

Practitioners are the ones who are engaged in the introduction, implementation, management as well as on-going assessment of e-government initiatives. As the study tries to figure out the enablers and evaluation dimensions in a comprehensive manner, it helps this group to better understand key considerations during e-government implementation and also position their strategies to materialize sustainable e-government endeavors. The framework we suggested can guide the practitioners (particularly e-Government project managers, top management, and other managers) in the course of e-Government implementation by helping them have better understanding on what to care for all through the implementation efforts, underlying reasons for failure and unsustainability of those initiatives, and also dictates possible solutions. For instance, the study provides an understanding on the need to consider local best practices, local contextual factors, building on local knowledge, local participation and ownership of the target group and availability of incentives for IT skills (at the districts) which contributed to the difference among districts in relation to the e-Government implementation. By so doing, the proposed framework serves as a tool to assess the sought quality of projects at pre-implementation, implementation, and post-implementation phases. Hence, late implementers of e-Government can benefit from e-Government implementation by considering a broader framework that focuses on the convergence of national, local, and organizational realities.

Specific to Ethiopia, this study presents an in-depth investigation of a G2G in Ethiopia. Such an exploration provides the Ethiopian government with an assessment of the performance of WoredaNet and other e-government initiatives in the country. It revealed some issues that need immediate intervention. First, the internal organization of the WoredaNet centers as well as their placement in the administrative structure of the districts has been source of couple of challenges. Among others, those challenges have performance as well as resource implications. Hence, the positioning of the WoredaNet centers in the organizational structure of districts needs to be reconsidered as per the expected horizontal and vertical relationships the centers need to have. The current practice in which WoredaNet centers are put under administrative division as a unit with no direct link with same unit at the regional governments significantly affected the WoredaNet centers from getting required resources, playing decisive role in the communication with other administrative units, and communicating with the regional ICT agency. Since WoredaNet is a government network that covers all tiers of government, implementation of such corrective action needs joint discussion among the federal, regional, and district ICT units. Secondly, a lot shall be done in awareness creation on the value of ICT in general and WoredaNet services in particular. The lack of awareness has impacted the expected all-rounded support from the top management. Leaders must visibly support the change because e-government is considered as a special case of business process change. Thus, the change shall start from the top management and the top management needs to ensure continuous engagement regarding the change. The top management also needs to assess readiness for the change and make adjustments accordingly. Similarly, lack of awareness among the civil servants also affected the institutionalization and ownership of the technology among the community. Need-based technology trainings and capacity building efforts

shall be done in a continuous basis for both the top management, civil servants, and ICT professionals as per the knowledge and skill gap. A lot needs to be done among stakeholders in terms of awareness creation on the e-government initiative. Continuous communication should be integral to the change effort. Such effort can improve their understanding of the expected benefits and let them accept the change effort. This ultimately can bring commitment from the stakeholders which is crucial for attaining what the country is aspiring to attain in the public sector.

#### **7.4 Summary of Limitations**

Given the limited research on e-government sustainability, we used an exploratory case study research approach. In our research design, we have chosen what questions to ask, and how to ask them, what data and issues to include and focus on, and what to exclude. We have also tried to present adequate evidence, from the data, to support the stories we tell, but a certain amount has to be taken on trust because no matter how rigorous we strive to be, case study research is not, and cannot be, completely objective.

Even if we adopted a multiple case study design in which four cases are considered (through literal and theoretical replication), we cannot claim that we have covered all possible factors and issues in relation to e-government success and sustainability. This may be because our research is considered as one of early attempts to contribute to the ongoing deliberations among researchers and practitioners. There is still insufficient literature at the outset about the two concepts and more importantly on e-government sustainability. The complex nature of e-government in general and the multidimensional nature of the two concepts also necessitate more researches in the future.

Our research mainly depended on empirical data based on perception of the stakeholders in which personal bias could not be totally ruled out though attempts were made to improve the quality of our deliverable. Actually this approach is chosen because of the controversial nature of the two core concepts and the operational definition derived for the two concepts at the outset in our research. Our with-in and cross-case analysis were based on predefined variables and we still believe that more detailed, explicit, rigorous set of coding steps (e.g open or closed coding, co-axial coding, and selective coding) could have been adopted. We believe that the number and diversity of interviewees in less as compared to the scope and complexity of WoredaNet. Besides maturity level could have been considered as additional construct for better result.

## **7.5 Implications for Future Research**

The literature review in chapter three reveals that including the sustainability perspective in managing and assessing the success of e-government initiatives is just at its early stage. The literature calls for more theoretical background as well as empirical findings in order to further clarify the concept. Our research tried to contribute to this call and tries to set a foundation for related future researches in e-government evaluation; but still there are opportunities for future research to generate new knowledge as well as make practical impact. In line with this, an integrated research agenda is proposed in section 3.5 based on (Klischewski & Lessa, 2012). The four themes of the research agenda are: (1) empirically assessing and understanding the problems in practice; (2) providing sufficient theory to explain the phenomena; (3) developing assessment

approaches (e.g. measurements); and (4) recommending best practice. As a follow-up to those research agenda, possible opportunities for future research are discussed in this section.

This research is an inductive one with the intension to come-up with theoretical propositions as contribution to knowledge based on observation in the field. The main objective of the research was to develop a framework by exploring the relationship between the two concepts and not to validate those relationships. For the framework to yield better results, the significance of the proposed relationships between variables of the two concepts need to be statistically measured through a quantitative research in same or similar setting to validate our findings. Thus, we suggest a quantitative research in same or a different research setting.

Given the limited research on e-government sustainability, we used an exploratory qualitative research. As our framework is first attempt of its kind, it contributes for discussion among scholars in the future. We feel that the proposed framework will serve as a spring-board for those researchers who are interested to improve it. This can be based on purely theoretical or practical-oriented researches.

Sustainability and success are multidimensional concepts that are defined differently in different subject areas and contexts. Although there is wider acceptance on the importance of the concepts across disciplines, there is still problem in implementing and explaining those concepts in practice. Thus, understanding ICT-related success and sustainability problems is a potential area for future research. Specific to e-government, for instance, internal and/or contextual problems that impact the success and sustainability of e-government initiatives need to be explored further. Similarly,

the perception of stakeholders regarding sustainability issues related to e-government success; and the impact of stakeholders' action and interaction on the long-term success are potentials for future research. There is also a possibility to explore the relationship between sustainability and other prominent organizational concepts such as change management and maturity in organizations. One can also argue as to how success and sustainability shall be viewed: from stakeholder or system perspectives (dimensions) and try to elucidate as which dimension better explains the concepts.

Different research approaches have their own advantages and drawbacks. Due to lack of extensive previous research on our research topic and our research questions, we adopted case study research approach. As a result, limitations of case study apply to our study although we have tried to use different validity and reliability measures to improve the research rigor. As an alternative, researchers in the future can use a method other than case study. We would like to also advocate a longitudinal research approach in the future because e-government projects experience major change over time.

Literature reveals that different theoretical lenses are used in information systems researches in general. Again the theoretical lenses have their own strengths and weaknesses. In our case, we have relied on structuration theory (particularly structurational model of technology) to guide the data collection, analysis, and reveal meaning out of the data. We believe that its application has been minimal. Besides, we feel that structuration theory is not the only theory to explore the topic. So, other theoretical lenses can be attempted in the future to explore the phenomenon in context and that may shed additional light to the ongoing discussion on the topic. Besides, we strongly suggest possibilities of using different analysis strategies for a better methodological rigor.

Accordingly, a more rigorous set of coding principles could be adopted and additional analysis can be made to highlight certain complexities or multi-level dependencies among the enablers. A 'design science' principles can also be used in future research to enhance the validity of the resulting framework. Maturity level can be considered as additional construct in the future for a better result. More interviewees (in number and diversity) and different types of e-Government can also be considered in the future.

In our research we have argued that e-government success and sustainability are different but interrelated concepts and we have attempted to show that the two are related to each other because both are related to same organizational reality i.e, IT-enabled admin processes. One can argue on the existence of the relationship and even the way the relationship is defined. Our effort to define constructs and variables to enable and evaluate e-government success and sustainability shall be considered as first attempt that needs to be enriched further. Besides, our effort was mainly aimed at developing a conceptual framework that explain e-government success and sustainability in a context. But we feel that further effort needs to be made to extend such frameworks to have not only explaining e-government sustainability in a context but also have capability to predict it.

As extension to the high level conceptual frameworks such as the one attempted in this research, there also needs to be reliable assessment approaches. Thus potential area for future research is developing an instrument and scales that can be used to measure the success and sustainability of e-government initiatives. Similarly, an attempt can be made to develop an assessment tool to trace involvement and related perspectives of stakeholders over time and measure long-term e-government benefits.

Our research is conducted in an Ethiopian context. Indeed we have used literal and theoretical replication of the cases considered for this study. Our research reveals that contextual factors significantly affect the success and sustainability of e-government efforts. Hence, cross-case study across nations (both in developed and developing country context) can bring additional insights and even better results.

E-government paves the way for a government to exercise its functions in an efficient and effective manner, hence transforms its relations with citizens, businesses or other arms of government. Although initial investment in e-government is high, extant literature show that there are only a few success stories whereas the majority of the efforts end up in a failure. This is a disturbing fact especially for developing countries as they have limited financial resources. One way to avoid such failure is to learn and expand best practices both within a nation and abroad. In this regard, one can explore a possibility for identifying and transferring best practices from one setting to other settings.

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# **APPENDICES**

## Appendix I: Constructs of interest and indicators

- a. *Variables related to leading case study question #1: “What is the performance of selected admin processes after they are being enabled by WoredaNet services in focus?”*

IT-enabled admin processes are at the core of e-government since e-government is mainly aimed at improving the performance of admin processes in government organs. Thus evaluating the success of e-government requires checking the level of improvements introduced to those admin processes. One way to effect such evaluation is using process performance measures appropriate to the given context as a metrics. Such performance measures reveal something important about the improvements achieved and in turn help stakeholders manage and improve what the organization does. Accordingly, the following are process performance measures identified for the purpose of this study in order to evaluate the degree of improvements made to the admin processes after the introduction of WoredaNet e-government services.

#	Variable	Indicators	References
1	Efficiency	<ol style="list-style-type: none"> <li>1. comparisons of costs and benefits (degree the process produces required output at minimum resource cost);</li> <li>2. Lesser processing time required to perform a task</li> </ol>	Bhatnagar, 2002; Rimmer, 2003
2	Effectiveness	<ol style="list-style-type: none"> <li>1. the process output conforms to requirements</li> </ol>	Bhatnagar, 2002; Rimmer, 2003

3	Service Quality	<ol style="list-style-type: none"> <li>1. service meets customer expectations in content and format;</li> <li>2. User gets personalized service</li> </ol>	Rotchanakitumnuai, 2008
4	Timeliness	<ol style="list-style-type: none"> <li>1. work done on time (service provided on time to the user).</li> </ol>	Osman et al., 2013
5	Productivity	<ol style="list-style-type: none"> <li>1. get rid of duplication of work</li> <li>2. value added by the new process (such as amount and frequency of information transfer between departments; enhance work moral; enhance delivery capacity, etc.)</li> </ol>	Graaand-Essers and Etedgui, 2003
6	Availability (up and running)	<ol style="list-style-type: none"> <li>1. Services are available whenever required by the user</li> </ol>	Chhabra and Jaiswal, 2008
7	Ease of use (User friendliness)	<ol style="list-style-type: none"> <li>1. Service usage requires minimal knowledge</li> </ol>	Osman et al., 2013
8	Usability	<ol style="list-style-type: none"> <li>1. Easy to consume services rendered by the process</li> </ol>	Osman et al., 2013
9	Accessibility	<ol style="list-style-type: none"> <li>1. Service is easily accessible to authorized users</li> </ol>	Osman et al., 2013
10	Correctness	<ol style="list-style-type: none"> <li>1. accurate delivery of service to the user</li> <li>2. service provided is free from errors;</li> </ol>	Graaand-Essers and Etedgui, 2003

*b. The following are variables related to leading case study question #2: “What is the stakeholder perception of the success and sustainability of using WoredaNet services and by which criteria (evaluation dimension)?”*

#	Variable	Indicators	References
1	Economic factor	1. direct cost savings for users/citizens and departments;	Bhatnagar, 2002; Rimmer, 2003
2	Social factor	1. Brought better access to knowledge 2. Improved capacity building efforts 3. Improved social communication	Rimmer, 2003 Ali et al., 2009
3	Political (government benefit) factor	1. improved government image (citizen's perception) 2. Brought citizen trust; 3. increased transparency and accountability	Rimmer, 2003; Karunasena et al., 2011
4	Institutional factor	1. improve decision making 2. increased employee participation in organizational communication;	Rimmer, 2003
5	Cultural factor	1. citizen/customer centricity; 2. alignment with changing environments (eg. user skill enhancement) 3. Brought more autonomy and responsibility; 4. enhanced stakeholders' involvement and communication 5. updated rules and regulations.	Chhabra and Jaiswal, 2008; Bhatnagar, 2002; Kanungo and Jain, 2011.
6	Technological factor	1. the system is connected well across government departments	Graaand-Essers and Ettetdgui, 2003

c. *The following are variables related to leading question #3: “What are the perceived enablers for making the WoredaNet initiative successful and sustainable?”*

***Enablers of e-government success***

1	Simple and clear project objectives	<ol style="list-style-type: none"> <li>2. Project objectives are easy to understand</li> <li>3. project objectives are clear to communicate;</li> <li>4. Project objectives are sensitive to the community’s needs</li> </ol>	Gichoya(2005); Bridges (2006); Pade et al. (2008)
2	Realistic project plan	<ol style="list-style-type: none"> <li>1. Project plan is reasonable and practical</li> <li>2. Project plan is achievable</li> <li>3. Project plan is sensitive to the community’s needs</li> <li>4. Project plan accountable to stakeholders</li> </ol>	Pade et al. (2008); Dzhusupova, et al (2011)
3	Leadership commitment	<ol style="list-style-type: none"> <li>1. providing all necessary resources;</li> <li>2. continuous support during the project implementation and throughout the operational phase of the system;</li> <li>3. willing to discuss problems associated with the system;</li> <li>4. appreciating the optimal use of the system;</li> <li>5. Try to have sufficient knowledge of the system</li> </ol>	Gichoya (2005); Zaiid (2012); Dzhusupova, et al (2011)
4	Cohesive implementation strategy	<ol style="list-style-type: none"> <li>1. Clear responsibility during project implementation;</li> <li>2. Planned coordination among project stakeholders;</li> <li>3. organized, consistent and unified implementation strategy is available (as how to implement the new system)</li> </ol>	Ndou (2004); Gichoya (2005); Dzhusupova, et al (2011)

5	Participation of target groups	<ol style="list-style-type: none"> <li>1. Participation of local stakeholders during project implementation</li> <li>2. Continuous communication with local stakeholders during project implementation (in introducing the goals and the benefits of the project, etc)</li> </ol>	Zaied (2012); Dzhusupova, et al (2011); Pade et al. (2008)
6	Focusing on local- /demand-driven needs	<ol style="list-style-type: none"> <li>1. Need assessment done in local context prior to project implementation;</li> <li>2. Inputs from local stakeholders were considered during project implementation</li> </ol>	Gichoya(2005); Kumar, et al. (2007); Park(2008); Dzhusupova, et al (2011); Pade et al. (2008); Grönlund et al. (2005)
7	Appropriate training and capacity building	<ol style="list-style-type: none"> <li>1. Availability of training that is sensitive to the community's ICT skill gaps</li> <li>2. availability of end user technical support as requested</li> </ol>	Dada (2006); Pade et al. (2008); Zaied (2012); Dzhusupova, et al (2011); De´(2006)
8	Build on local knowledge expertise	<ol style="list-style-type: none"> <li>1. Take into consideration the local context associated with sharing knowledge</li> </ol>	Dzhusupova, et al (2011); Pade et al. (2008)
9	Motivation and incentives for IT skills	<ol style="list-style-type: none"> <li>1. IT skills acquired are recognized and valued by the management</li> </ol>	Pade et al. (2008)
10	Choosing appropriate technology	<ol style="list-style-type: none"> <li>1. right technology selected for rural environments</li> </ol>	Bridges (2006); Pade et al. (2008)
11	Understanding of local political context	<ol style="list-style-type: none"> <li>1. actions taken to lessen the political effects (especially from government officials) during project implementation</li> <li>2. project buy-in by local authority (such as government officials)</li> </ol>	Furuholt & Wahid (2008); Bridges (2006); Pade et al. (2008)

*Enablers of sustainability (beyond e-government success)*

1	Long-term vision	1. the specific needs of the local context (local community) considered at large	Heeks (2008); Ndou (2004); Pade et al. (2008)
2	Developing sense of ownership	1. local buy-in well encouraged; 2. sense of willingness developed to invest effort and resources in the project	Dada (2006); Dzhusupova, et al (2011); Bridges (2006); Pade et al. (2008); Sarantis et al. 2011
3	Continuously meeting stakeholders needs	1. the project keeps meeting the needs of at least some stakeholders; (Project continued to be useful to someone)	Heeks (2005); Dzhusupova, et al (2011)
4	Building local partnership of stakeholders	1. Use competencies and capacities of different actors (internal and external parties) based on their particular mandates	Bridges (2006); Pade et al. (2008)
5	Independence from external assistance	1. presence of long-term political commitment to avoid dependence on assistance from outside 2. presence of an institution to lead, coordinate and sustain the project	(Grönlund et al.(2005); Heeks (2001); Heeks (2005); (Schuppan 2009); Dzhusupova, et al (2011)
6	Using IT to enhance development activities	1. The project was integrated to local organizational (and existing rural development) activities; 2. project provided a more immediate and identifiable development benefit	Pade et al. (2008)
7	Ongoing monitoring and evaluation	1. continuous evaluation and monitoring on project performance; 2. communicate stakeholders on the change that has occurred in the community as a result of the project	Kumar & Best (2006) ; Bridges (2006); Pade et al. (2008)

		3. identify and understand shortcomings of the project and improve on past experience	
8	Understanding of local political dynamics	1. Understand and manage the political effect of local authority on the continued smooth operation once the project is delivered	Furuholt & Wahid (2008); Bridges (2006); Pade et al. (2008)
9	Institutionalizing projects into local setting	1. projects deliverables embedded in the rules and norms, culture and values of local setting	Schuppan (2009); Heeks (2005)
10	Sustaining political leadership	1. There is long-term political commitment to promote and support process improvements and resulting benefits	Grönlund et al (2005); Kumar & Best (2006); Furuholt & Wahid (2008); (Heeks 2001); (Kifle et al. 2009)
11	Developing institutional administrative and coordination capacity	1. awareness created among officials and employees; 2. strong collaboration among different functions and admin levels; 3. effective change management administered	Dada (2006); Basu (2004); Jaeger (2003); Heeks (2003)
12	Continuously matching available resources	1. local capacity and facility considered to assure project continuity 2. the project continues to match locally available resources (money, skills, technology) and local organizational environment	Schuppan (2009); Pade et al. (2008); Heeks (2005)
13	Cultivating an influential project champion	1. There is project champions who can inspire, drive, create awareness, and encourage the targeted community to use ICT;	Pade et al. (2008)

Appendix II: Changes that have to be managed in e-Government implementation  
(Source: Nograšek, 2011, p.17)

Element	Extent of changes	Authors
<b>Technology</b>	<ul style="list-style-type: none"> <li>- national information infrastructure</li> <li>- network infrastructure and network databases</li> <li>- architecture interoperability</li> <li>- compatible data standards (Extensible Markup Language – XML)</li> <li>- compatible technical standards</li> <li>- security models</li> <li>- implementation of discussion support, multimedia, automation, tracking and tracing and personal identification technologies</li> </ul>	Lam (2005), Al-kaabi & Hattab (2009), Abulai Alawneh & Mohammad (2010), Saboohi & Sushil (2010), Zarei, Ghapanchi & Sattary (2008)
<b>Processes</b>	<ul style="list-style-type: none"> <li>- changes to the entire process (consideration of business process change principles from the private sector)</li> <li>- significantly accelerated process execution (from a few minutes to a couple of seconds); process can be executed 24/7</li> <li>- horizontal (integration among functions and departments) and vertical process executions (integration among organisations)</li> <li>- changes to the rules, which determine the process (trust, safety, maintenance and integrity must be dealt with therein)</li> </ul>	Layne & Lee (2001), Scholl (2003), Elnaghi, Alshawi, & Missi (2007), Indihar Štemberger & Jaklič (2007), Kim, Pan & Pan, (2007), Klievnik & Janssen (2009), Politt (2010)
<b>People</b>	<ul style="list-style-type: none"> <li>- the employees must gain a horizontal process view</li> <li>- new and complex skills (e.g. self-organisation, confrontation with unexpected tasks) and knowledge</li> <li>- staff training must be organised, collective learning must be encouraged</li> <li>- leaders must be able to combine their ICT knowledge and skills with their understanding of the process dimension</li> <li>- leaders must be able to develop a strategic vision and comprehensive human resource management, project management and user-orientation strategies</li> </ul>	Layne & Lee (2001), Ho (2002), O'Donnell, Boyle & Timonen (2003), Griffin, Foster & Halpin (2004), Leitner & Kreuzeder (2005), Indihar Štemberger & Jaklič (2007), Kim et al. (2007)

Changes that have to be managed in e-Government implementation (Source: Nograšek, 2011, p.17) (Cont'd)

<b>Organizational Culture</b>	<ul style="list-style-type: none"> <li>- transition to a service-oriented culture</li> <li>- the employees must overcome departmentalisation thinking</li> <li>- organisational loyalty must be strengthened</li> <li>- employees must be encouraged to perform more challenging tasks, to be willing to take responsibility</li> <li>- inter-departmental and inter-organisational cooperation and trust must be strengthened</li> <li>- the understanding of organisational learning must be strengthened</li> <li>- the leaders' way of thinking must be radically changed</li> </ul>	<p>Ho (2002), O'Donnell, et al. (2003), Schedler &amp; Schmidt (2004), Leitner &amp; Kreuzeder (2005), Kim, et al. (2007)</p>
<b>Structure</b>	<ul style="list-style-type: none"> <li>- it must be taken into account, that, on one hand, due to the horizontal and vertical integration (activities are being de-centralised, a great level of flexibility in task-performing is required), tasks are undergoing a de-specialisation process, while on the other hand, a new task-structuring is required</li> <li>- data digitalisation must be standardised, procedures being standardised for several departments or organisations simultaneously (e.g. the introduction of e-public procurement), common standards being applied (e.g. XML structures)</li> <li>- as procedures are simplified and informatised, the level of formalisation is decreased, while, on the other hand, a new procedure execution method requires new record safety, trust, maintenance and integrity rules</li> <li>- decisions on the introduction of e-government is transferred to e-leaders, which appear both on the top (eLeadership) and the middle level (eChampions, CIO leaders), which leads to a decentralised decision-making process, nevertheless their coordination and control role is strengthened</li> <li>- the hierarchical structure is transformed into a network one</li> </ul>	<p>Layne &amp; Lee (2001), O'Donnell et al. (2003), Scholl (2003), Griffin et al. (2004), Leitner &amp; Kreuzeder (2005), Maniatopoulos (2005), Kim et al. (2007), Klievnik &amp; Janssen (2009), van Veenstra, Janssen &amp; Tan (2010)</p>

## Appendix III: Instrument for Data Collection

**Leading case study question #1:** Questions in this category belong to the IT enabled admin process. The variables help us measure the degree of improvement gained as a result of introduction of the new WoredaNet services. Both actual and perceived performance gains will be identified. **Informants are:** *Process owners and service users*

#	Variable	Indicators
1	Efficiency	<ol style="list-style-type: none"> <li>1. Do you think your process produces required output at minimum resource cost as a result of the new e-government service?</li> <li>2. What is your perception about processing time required to perform a task?</li> </ol>
2	Effectiveness	<ol style="list-style-type: none"> <li>1. How do you perceive the conformity of your process output to requirements as a result of the new service?</li> </ol>
3	Service Quality	<ol style="list-style-type: none"> <li>1. Do you think the new e-government services more helped your process meet customer expectations in content and format?</li> <li>2. Does the new service enhanced your process capability to provide services in need basis?</li> </ol>
4	Timeliness	<ol style="list-style-type: none"> <li>1. Do you think the use of the new service helped you perform your tasks on time?</li> </ol>
5	Productivity	<ol style="list-style-type: none"> <li>1. Is the new system helped you get rid of duplication of work?</li> <li>2. What is your perception on the value added by the new process (such as amount and frequency of information</li> </ol>

		transfer between departments; enhance work moral; enhance delivery capacity, etc.)?
6	Availability (up and running)	1. Do you think the new system helped your process avail its services whenever required by the user?
7	Ease of use (Use friendliness)	1. Do you think it is easy to learn and use the new system to better perform your tasks?
8	Usability	1. Do you think the new system helped you provide the users with what they can immediately use for the purpose it is meant for?
9	Accessibility	1. Do you think an authorized users can easy access the new system?
10	Correctness	1. How accurate is your delivery of service to the user? 2. To what extent does the new system helped you perform error free tasks?

**Leading case study question #2:** Questions in this category belong to the perception of the informants on the success/sustainability or failure of the WoredaNet e-government service and their criteria for same. **Informants are:** Service users, process owners, IT support staff, District Administrators.

#	Variable	Indicators
1	Economic factor	1. Do you think there are direct cost savings for users/citizens and departments as a result of the new system?
2	Social factor	1. What is your perception on the role of the new system in bringing better access to knowledge, improved capacity building opportunity, and better social communication?
3	Political (government benefit) factor	1. Do you think the new system improved citizen's perception on government (brought citizen trust)? 2. What is your perception on the role of the new system in bringing transparency and accountability?
4	Institutional factor	1. Do you think the new system improved decision making practice at different levels? 2. Do you think the new system increased employee's participation in organizational communication?
5	Cultural factor	1. Do you think the new system requires alignment with the changing environments (eg. user skill enhancement)? 2. How do you perceive citizen/customer centricity of the new system? 3. Do you feel the new system brought more autonomy and responsibility to employees? 4. Do you think the new system enhanced stakeholders' involvement in organizational matters? 5. Do you think the new system can bring changes in organizational rules and regulations?
6	Technological factor	1. How well is the degree of connectivity of the new system across government departments?

**For leading case study question #3:** Questions in this category belong to perceived enablers for making the WoredaNet initiative successful and sustainable? **Informants are:** District Administrators, IT support staff, process owners

*Enablers of e-government success*

1	Simple and clear project objectives	<ol style="list-style-type: none"> <li>1. Do you think the project objectives are easy to understand and clear to communicate?</li> <li>2. How do you feel sensitive of the project objectives to the community's needs?</li> </ol>
2	Realistic project plan	<ol style="list-style-type: none"> <li>1. Do you think the project plan was reasonable and achievable (practical)?</li> </ol>
3	Leadership commitment	<ol style="list-style-type: none"> <li>1. What is your evaluation on the provision of all necessary resources for the smooth operation of the project?</li> <li>2. Is there top management's continuous support during the project implementation and throughout the operational phase of the system?</li> <li>3. Is the top management willing to discuss problems associated with the system?</li> <li>4. Does top management appreciate the optimal use of the system?</li> <li>5. Do you think top management is willing to have sufficient knowledge of the system?</li> </ol>
4	Cohesive implementation strategy	<ol style="list-style-type: none"> <li>1. Was there planned coordination and clear responsibility among project stakeholders during project implementation?</li> <li>2. Was there organized, consistent and unified implementation strategy (as how to implement the new system)?</li> </ol>

5	Participation of target groups	<ol style="list-style-type: none"> <li>1. How was participation of local stakeholders during project implementation?</li> <li>2. Was there continuous communication with local stakeholders during project implementation (in introducing the goals and the benefits of the project, etc)?</li> </ol>
6	Focusing on local- /demand-driven needs	<ol style="list-style-type: none"> <li>1. Was there need assessment done in local context prior to project implementation?</li> <li>2. Do you think inputs from local stakeholders were considered during project implementation?</li> </ol>
7	Appropriate training and capacity building	<ol style="list-style-type: none"> <li>1. What is your perception on the availability and appropriateness of training that is sensitive to the employees' ICT skill gaps?</li> <li>2. Is end user technical support available on request?</li> </ol>
8	Build on local knowledge expertise	<ol style="list-style-type: none"> <li>1. Do you think the local context associated with sharing knowledge is considered to promote the project buy-in?</li> </ol>
9	Motivation and incentives for IT skills	<ol style="list-style-type: none"> <li>1. Do top management recognize and value the IT skills acquired by employees?</li> </ol>
10	Choosing appropriate technology	<ol style="list-style-type: none"> <li>1. Do you the right technology selected for the local environment for this project?</li> </ol>
11	Understanding of local political context	<ol style="list-style-type: none"> <li>1. How were the negative political effects, if any, especially from government officials handled during project implementation?</li> <li>2. Do you think there is project buy-in by local authority (such as government officials)?</li> </ol>

*Enablers of sustainability (beyond e-government success)*

1	Long-term vision	1. Do you think the specific needs of the local context (local community) considered at large during project implementation?
2	Developing sense of ownership	1. Do you think local buy-in is well encouraged by the top management? 2. How was the effort to develop sense of willingness to invest effort and resources in the project?
3	Continuously meeting stakeholders needs	1. Do you think the project has been meeting the needs of at least some stakeholders (project continued to be useful to someone)?
4	Building local partnership of stakeholders	1. What is your perception on the use of competencies and capacities of different actors (internal and external parties) to keep the project functional?
5	Independence from external assistance	1. Was there long-term political commitment to avoid dependence on assistance from outside? 2. Do you think there is an institution (or unit) to lead, coordinate and sustain the project?
6	Using IT to enhance development activities	1. Was the project was integrated to local organizational (and existing rural development) activities? 2. Do you think the project provided a more immediate and identifiable development benefit?
7	Ongoing monitoring and evaluation	1. Was there continuous evaluation and monitoring on project performance? 2. Was there effort to identify and understand shortcomings of the project and improve on past experience?
8	Understanding of local political dynamics	1. How do you think is the necessity of political effect of local authority on the continued smooth operation once the project is delivered?
9	Institutionalizing projects into local setting	1. Do you think projects deliverables and usage requirements embedded in the rules and norms, culture and values of local setting?

10	Sustaining political leadership	1. Do you think there is long-term political commitment to promote and support process improvements and resulting benefits?
11	Developing institutional administrative and coordination capacity	<ol style="list-style-type: none"> <li>1. Was there awareness creation effort among officials and employees?</li> <li>2. Do you think there was strong collaboration among different functions and admin levels during project implementation?</li> <li>3. What is your perception on the change management effort during project implementation?</li> </ol>
12	Continuously matching available resources	<ol style="list-style-type: none"> <li>1. Do you think the project considered local capacity and facility to assure project continuity?</li> <li>2. Do you think use of locally available resources (money, skills, technology) and local organizational environment contributed for the project continuity?</li> </ol>
13	Cultivating an influential project champion	1. Do you think there is project champions who can inspire, drive, create awareness, and encourage the use the new system?

## Appendix IV: List of publications

The following are list of publications:

1. Lessa, L., Klischewski, R., Belachew, M., and Anteneh, S. (2015) Towards a Conceptual Framework for Pledging Sustainable e-Government Success: The Case of G2G in Ethiopia. IEEE AFRICON 2015 Conference Proceedings; 14th-17th September 2015, Addis Ababa, Ethiopia.
2. Lessa, L., Belachew, M., and Anteneh, S. (2011) Sustainability of E-Government project Success: Cases from Ethiopia. Proceedings of the Seventeenth Americas Conference on Information Systems (AMCIS2011), Detroit, Michigan August 4th-7th 2011.
3. Klischewski, R. and Lessa, L. (2012) Sustainability of E-Government Success: an Integrated Research Agenda. in: Scholl, H.J., et al. (eds.). Proceedings Electronic Government and Electronic Participation 2012, Trauner Verlag, Linz, 2012, pp. 153-164.
4. Klischewski, R. and Lessa, L. (2013) Sustainability of E-Government Success: An Integrated Research Agenda, in E-Government Success Factors and Measures: Theories, Concepts, and Methodologies. Gil-Garcia, J. (Ed.). Chocolate Avenue, Hershey, USA: Information Science Reference, IGI Global, 2013, pp. 104-123. Web. 2 Aug. 2013. doi:10.4018/978-1-4666-4058-0.ch007.